ume XXX.
ber 1.

OCTOBER, 1905.

$2.00 per year.
$3.00 with Directory.

TEXTILE WORLD RECORD

LORD & NAGLE COMPANY · Boston & Philadelphia

COPYRIGHT, 1905, LORD & NAGLE COMPANY.

rt of the proceedings at meeting of the N. E. Cotton Manufacturers' Assn. at Atlantic City is contained in this number.

TS1300
.T36

The Textile-Finishing Machinery Co.

17 EXCHANGE PLACE, PROVIDENCE, R. I.

Mercerizing Machinery for Piece Goods and Yarn in the Warp or Chain

Singeing Machines,

Boiling Kiers,

Washers, Squeezers,

Chemic and Sour

Rusden Patent

Continuous Chainless

Steamer,

Aniline Agers,

Dyeing Machines,

Open Soapers,

Blanket Washers,

Color Kettles,

Horizontal or Vertical Drying Machines, with Copper or Tinned Iron Cylinders,

Automatic Tentering Machines,

Water and Starch Mangles,

Dampening Machines,

Dyeing Machines for Chain Warps.

BUILDERS OF ALL KINDS OF

MACHINERY

FOR

BLEACHING
DYEING
DRYING

AND

FINISHING

Calenders for Rolling, Glazing, Chasing and Embossing, also Calenders for Moire Finish.

Sole Manufacturers of Patented Flexible Cloth Expander for Cylinder Drying Machines, Calenders, Mangles, &c.

Patent Combination Rolls Made of Cotton and Husk, especially adapted for Soft Finish, Unequalled for Elasticity and Durability.

Cotton, Paper, Husk, Chilled Iron, Brass and Rubber Rolls, Electro-deposited Copper Rolls for all Purposes.

Padding and Drying Machines for Shade Cloths.

Single and Double Cylinder Engines.

Hydraulic Presses and Pumps.

ALL KINDS OF OUTFITS FOR BLEACHING THREAD AND SOFT TWISTED YARN.
BLEACHING MACHINERY FOR YARNS IN THE WARP OR CHAIN.

Estimates, Drawings and full particulars of complete plants furnished on application

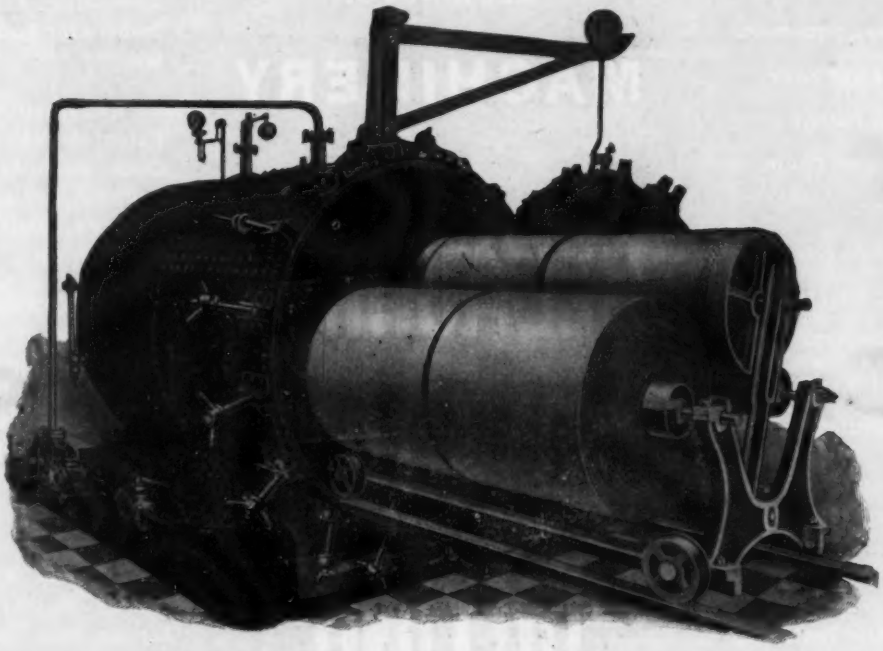
Southern Agent, STUART W. CRAMER, Trust Bldg., Charlotte, N. C., Equitable Bldg., Atlanta, Ga.

Open Bleaching System

OF

JACKSON & HUNT

Patented in the United States, Great Britain and the Continent
U. S. Patent, January 15th, 1901. No. 666,056



H. W. Butterworth & Sons Co.

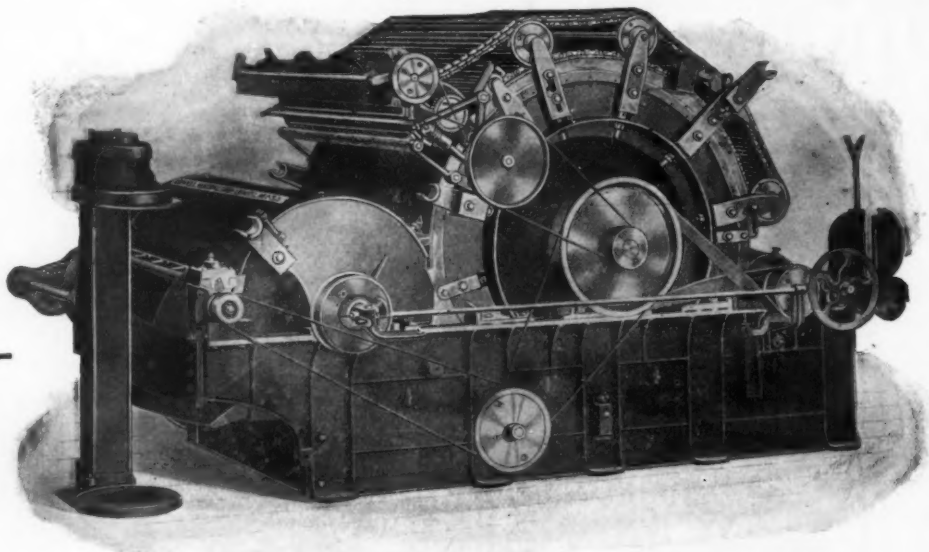
Manufacturers of

Bleaching, Dyeing, Drying and Finishing Machinery

YORK AND CEDAR STREETS

PHILADELPHIA

Sole Makers for the United States



Cotton and Worsted Machinery

With Modifications to Suit Any Class of Work.

Cotton Machinery: Cards, Railway Heads, Drawing Frames, Fly Frames, Speeders, Ring Spinning Frames, Twisters, Spoolers, Reels, Warpers, Slashers, Winders, Looms, Shearing Machines, Balling Machines, Folders, Stamping Machines, Sewing Machines, Size Pumps, Size Kettles, Drawing-in Frames, Baling Presses, Indigo Grinders.

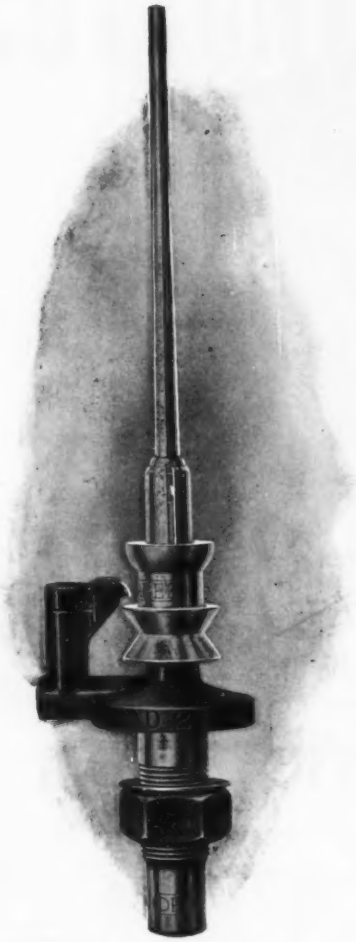
Worsted Machinery: Spinning Frames with caps, rings or flyers, Dandy Rovers and Reducers, Cone Second Finishers, Reducers and Rovers, Gill Boxes for Drawing, Preparing and Finishing, Weigh Boxes and Drawing Boxes, Cap Trap, Flyer and Ring Twisters.

Plans, Specifications and Estimates furnished upon application.

Lowell Machine Shop

LOWELL, MASS.

A New Spindle Improvement



The Rabbeth Centrifugal Bobbin Clutch.

Fits the Bobbin loosely when at rest—allows considerable variation in fit.

Bobbins will all go down into place and Traverse can be lengthened.

Allows easier and quicker doffing — stronger bobbins — less reaming.

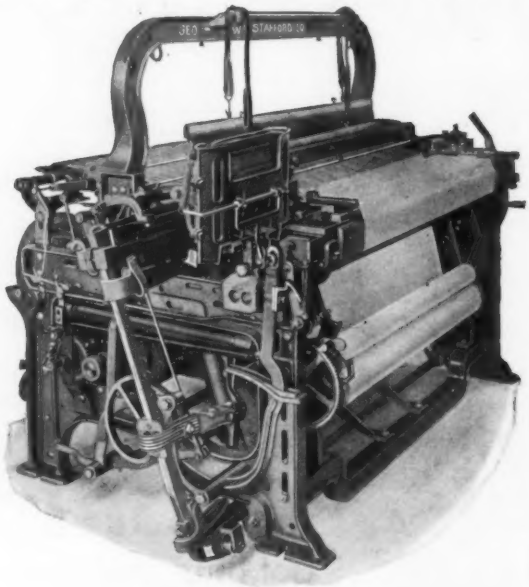
Draper Company, Hopedale, Mass.

We Also Build Looms.

THE GEO. W. STAFFORD COMPANY

WEAVING MACHINERY

READVILLE, MASS.



Ideal Automatic Loom

History Repeats Itself

Our previous successful efforts in the line of improvements in weaving machinery have culminated in our new

IDEAL AUTOMATIC LOOM

Considering quantity of goods produced per weaver, quality of goods, cost of supplies, repair bills, etc., there is no other loom can compare with it for economy of operation.

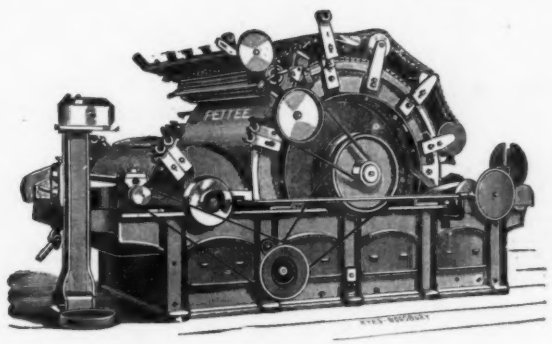
Cop or bobbin filling may be used equally well. One weaver can operate successfully from twelve to thirty looms, and under favorable conditions even more. No reduction in speed. A high grade plain loom as a basis.

Write for further particulars

Saco and Pettee Machine Shops

NEWTON UPPER FALLS, MASS., U. S. A.

COTTON MACHINERY



PICKERS,
REVOLVING FLAT CARDS,
DRAWING FRAMES,
RAILWAY HEADS,

SLUBBING,
INTERMEDIATE AND ROVING FRAMES,
SPINNING FRAMES,

SPOOLERS AND REELS.

Shops: { Biddeford, Me.
Newton Upper Falls, Mass.

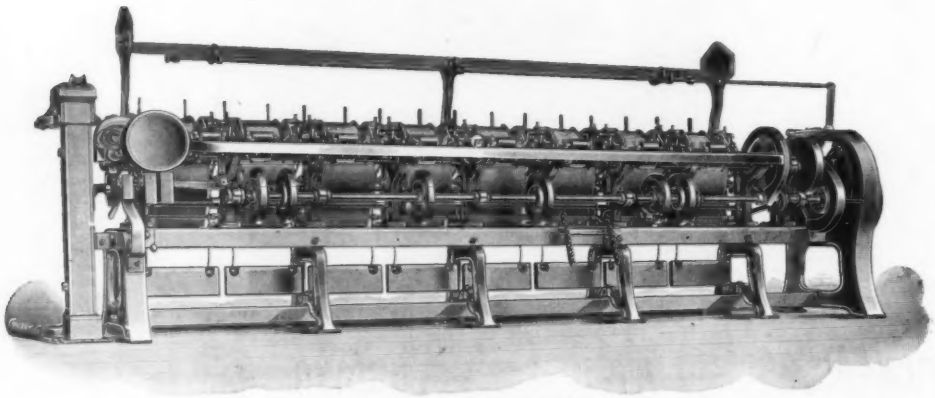
Southern Agent, A. H. WASHBURN, Charlotte, N. C.

THE

WHITIN MACHINE WORKS,

Cotton Machinery

WHITINSVILLE, MASS.



The Whitin 8 Head Comber.

Southern Agent, . . . S. W. CRAMER

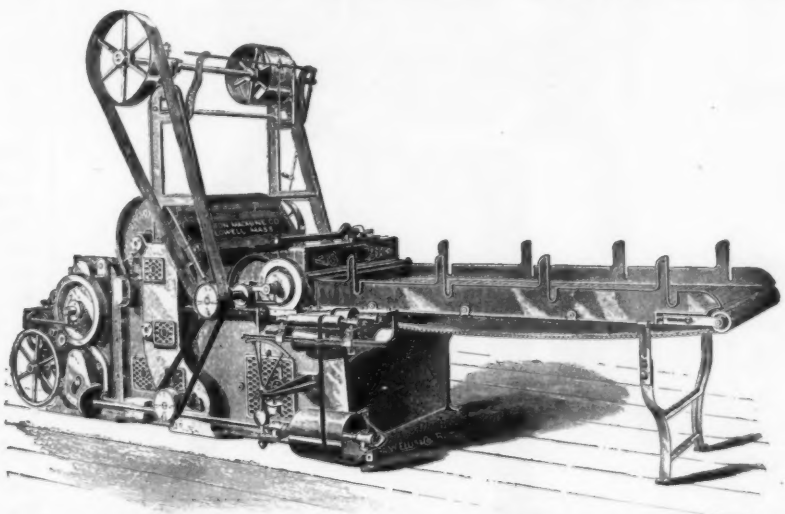
Trust Building, CHARLOTTE, N. C.
and Equitable Bldg, ATLANTA, GA.

Revolving Flat Carding Engines,
Sliver Lap Machines,
Ribbon Lap Machines,
Combers,
Railway Heads,
Drawing Frames,

Spinning Frames,
Spoolers,
Twisters,
Reels,
Looms,
Long Chain Quilling Machines.

The Best Pickers

In the Cotton Field nothing equals the DARKY COTTON PICKERS.



In the Cotton Mill nothing equals the KITSON COTTON PICKERS.

KITSON MACHINE CO., LOWELL, MASS.

LARGEST BUILDERS OF COTTON OPENERS AND LAPPERS IN THE WORLD.

STUART W. CRAMER, Southern Agt., Charlotte, N. C. and Equitable Bldg., Atlanta, Ga.

SCOTT & WILLIAMS

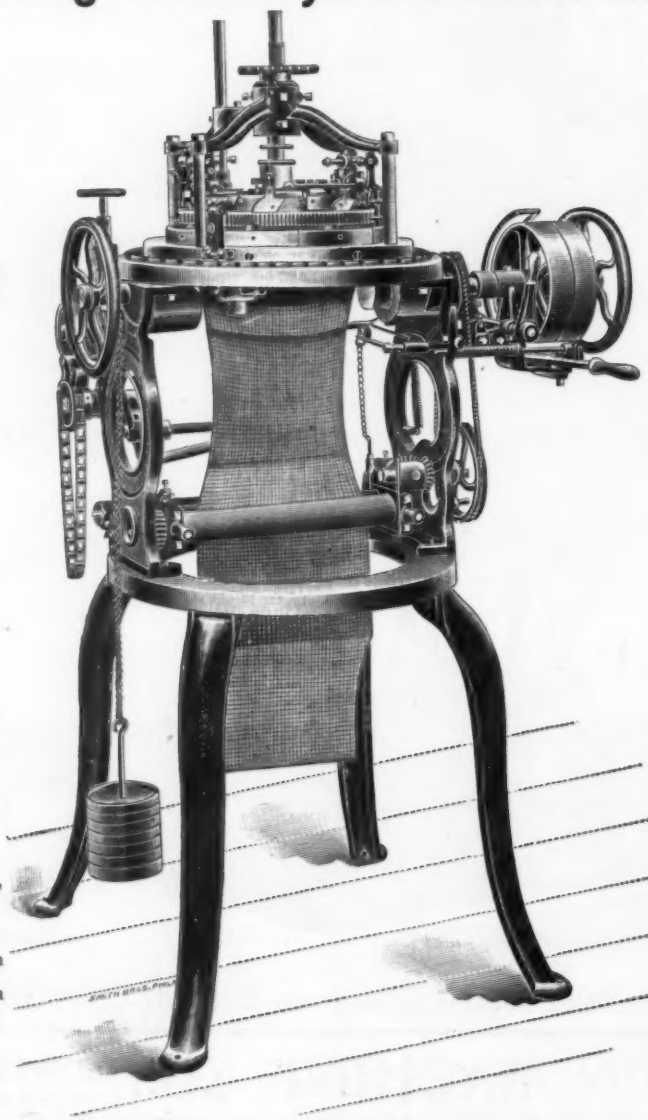
BUILDERS OF

Rib Knitting Machinery for Underwear and Hosiery

The illustration shows our

Improved High Speed Single Lever Automatic Ribbed Underwear Machine

for making ladies' and gents' ribbed underwear, union suits, etc., plain and shaped.



Plain, Single Lever or with Welt, Slack Course and Automatic Slackening Device for Welt.

Improved Measuring Device, by actual length knit.

Sizes. 8 to 24 inches, inclusive, varying by one inch.

Number of Feeds, four to 12, according to style and diameter of machine.

Solid Forged Steel Cylinders, specially hardened or with patent inserted walls for fine fabric.

Special Machinery for Sweaters etc.

We build Loopers, Ribbers and other Machinery for Knitting Mills

As well as

A Complete Line of Full Antomatic and 7-8 Automatic Seamless Hosiery Machinery.

Full Particulars, Samples and Special Catalogues on Application.

2079 E. Cumberland Street, Philadelphia, Pa., U. S. A.

PLAN OF NASMITH COMBERS

SCALE 1/8"—1 FOOT.

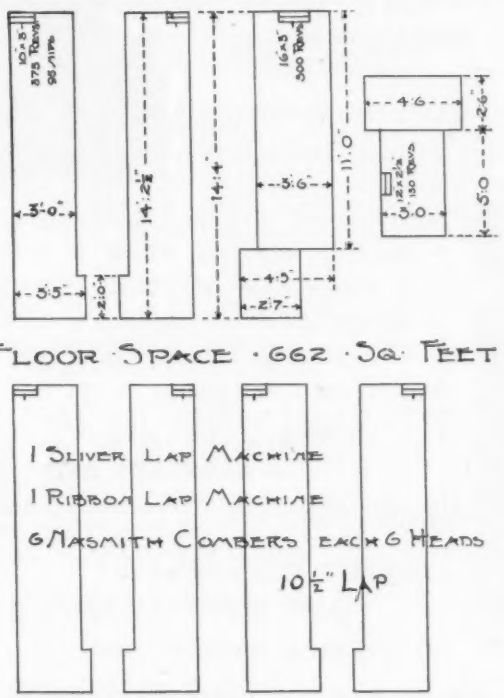
1 Sliver Lap Machine. 1 Ribbon Lap Machine.
1 Set of 6 Nasmith Combers 6 Heads Each 10 1-2" Lap.

PRODUCTION from **4200 to 5000 lbs. per week** set of 6 Nasmith Combers 10½" lap as against
2600 to 2800 lbs. per week on 8 Heilmann Combers 8¾" lap.

SAVING **50% in Power.** **50% in Floor Space.** **SAVING**

Double the Production ANY LENGTH OF STAPLE. **Better Quality**

"Does This Interest You?"



"ONE Machine Instead of TWO."

STEPHEN C. LOWE,

AGENT FOR

JOHN HETHERINGTON & SONS, Ltd., Manchester, Eng.,

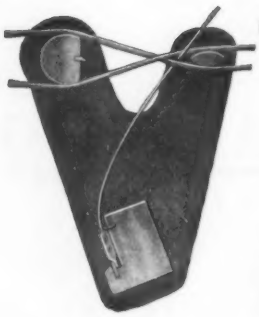
MAKERS OF ALL KINDS OF

TEXTILE MACHINERY and NASMITH'S PATENT COMBER.

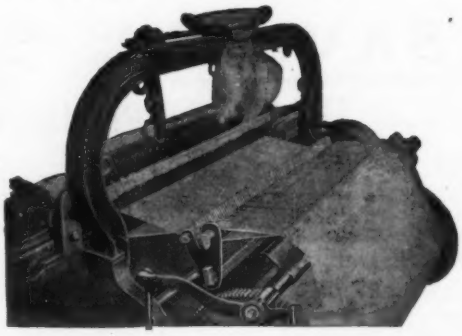
Send for Catalogues. **186 Devonshire Street, Boston, Mass.**

FULL LINE OF PARTS CONSTANTLY IN STOCK.

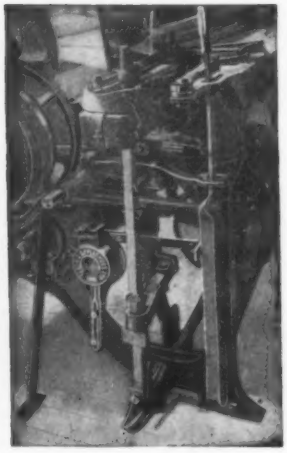
Absolute Efficiency from Bed-Rock Simplicity



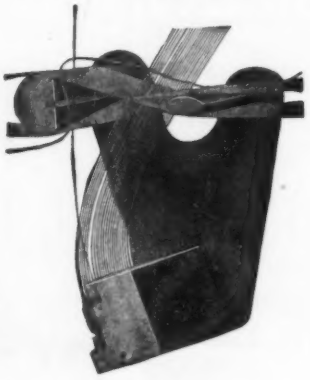
Our **WARP-STOP** controls
TWO threads by ONE spring WIRE, held in a COMB,
engaging the warp
in such a way that
the TENSION is UNDER CONTROL,
and
ABRASION of the yarn is AVOIDED.



The COMBS are RAPIDLY INSERTED, BEFORE or AFTER the warp is in the loom,
and are carried in a
bar suspended from **the LEASE-RODS** which **ARE NOT FIXED** to the loom side, but **FREE to take their proper positions,** and **ALLOW the NATURAL MOVEMENT of the WARP,** so that **the COVER of the cloth is UNAFFECTED.**



When a thread breaks the WIRE SPRINGS OUT from the comb, thus giving
a CLEAR SIGNAL of the place of the BROKEN END,
and, by striking
a CONTACT SLIP upon which LINT CANNOT COLLECT,
closes the circuit through
a PERFECT KNOCK-OFF, EASILY and RAPIDLY FIXED, and **actuated by a SPARKLESS current.**



American Textile Appliances Co.

WILLIAM FIRTH, Treasurer.

79 MILK ST., BOSTON, MASS.

EVAN ARTHUR LEIGH

232 Summer Street (opposite the South Station), Boston, Mass.

SOLE AGENT IN THE UNITED STATES AND CANADA FOR

Platt Bros. & Co., Ltd.

BY FAR THE LARGEST MAKERS IN THE WORLD OF

Cotton, Woolen and Worsted Machinery

Platt's Patent Opening and Picking Machinery.
Platt's Cotton Comber will comb from 7-8″ stock to Sea Islands.
Platt's Special Machinery for Making Cotton Waste into Yarns.
Platt's Special Machinery for Making French Worsted Yarns.
Platt's Woolen and Worsted Carding Engines, Special Designs.
Platt's Cotton, Cotton Waste, Woolen and Worsted Mules.

MATHER & PLATT, LTD.

Dyeing and Finishing Machinery. Archbutt-Deeley System for purifying and softening water.

TEXTILE MACHINERY ASSOCIATION, LTD.

Flax, Hemp and Jute Machinery.

THE PATENT AUTOMATIC FEEDING MACH. CO., LTD.

Patent Feeding Machines for wool, cotton, flax, fur and fibrous material

GEORGE HODGSON, LTD.

Looms for Worsteds, etc.

JOSEPH SYKES BROS., Card Clothing for Cotton.

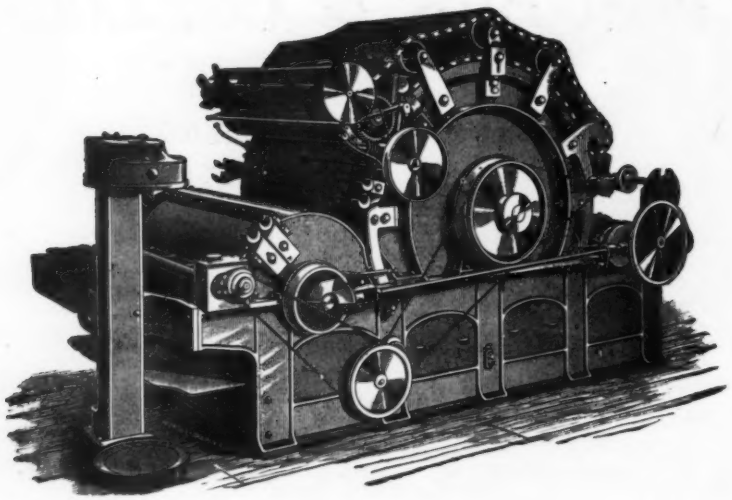
JAMES CRITCHLEY & SON'S, Card Clothing for Woolen and Worsted.

DRONSFIELD BROS'. Grinding Machinery and Emery Filleting.
The Best French and English Combing and Rubbing Aprons.
Harding's Pins and Circles, Varey's Fallers, etc.

MASON MACHINE WORKS,

TAUNTON, MASS.

Cotton Machinery



Cards, Combers, Railway Heads, Drawing Frames, Spinning Frames, Mules and Looms,

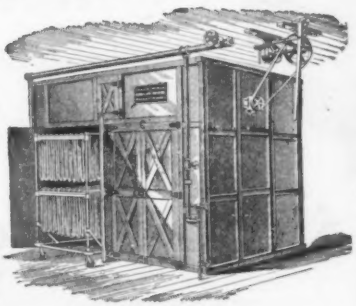
INCLUDING

Plain and Fancy Silk Looms

Southern Office, Charlotte, S. C.

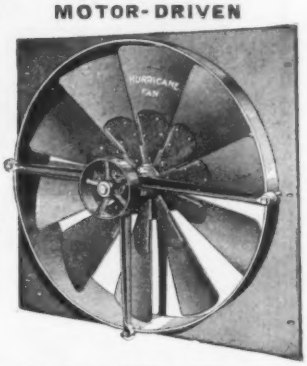
"HURRICANE" DRYERS AND FANS

For WOOL,
COTTON STOCK,
YARN, STOCKINGS,
UNDERWEAR,
Etc.

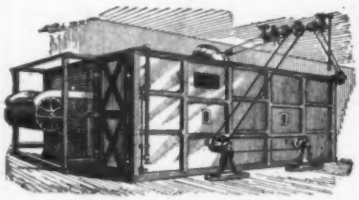


Truck Yarn Dryer.

BELT-DRIVEN
MOTOR-DRIVEN



"Hurricane" Fan, Style No. 2.
Write for Catalogues.



Cotton Stock and Wool Dryer.

CARBONIZING,
BLEACHING,
OXIDIZING, CHROMING and WASHING MACHINERY.

PHILADELPHIA DRYING MACHINERY CO.
6721 Germantown Ave., Philadelphia, Pa.

Fairbairn Lawson Combe Barbour, Ltd.

LAWSON BRANCH,

Hope Foundry. LEEDS. England.

MAKERS OF MACHINERY FOR

PREPARING AND SPINNING FLAX, HEMP, TOW AND JUTE

AND OF

Special Machinery for the Manufacture of Twines,

ALSO OF

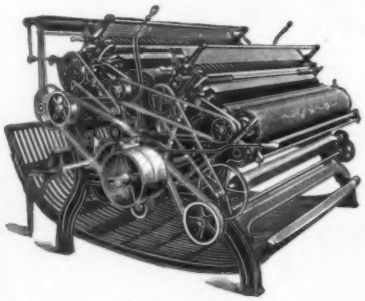
GOOD'S COMBINED HACKLING AND SPREADING MACHINE,
LONG REACH SCREW-GILL DRAWING FRAMES,
CHAIN-GILL DRAWING FRAMES with Apron Head,
PATENT HIGH-SPEED HORIZONTAL AND AUTOMATIC SPINNING FRAMES FOR MANILLA,

AND OTHER

Special Machinery for the manufacture of Rope Yarns and Binder Twine.

IMPROVED LAYING MACHINES. HASKELL-DAWES TUBING TWISTERS
BROWNELL'S PATENT TWISTING AND LAYING MACHINES FOR TWINE.

Complete Plans and Estimates for Flax, Tow, Hemp and Jute Mills, Trawl Twine Factories and Steam Ropeworks.



Our New Forty-four Page

SHEAR BOOK

tells why the

DOUBLE SHEAR

Saves $400 Every Year

Contains the best Grinding Directions
ever published.

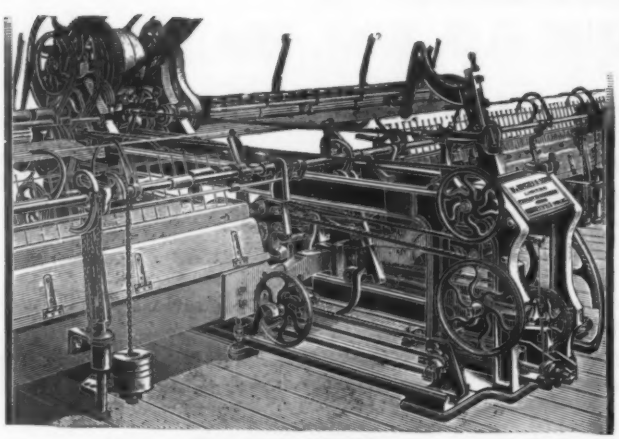
Free to Every Finisher

PARKS & WOOLSON MACHINE CO
SPRINGFIELD VERMONT

Telegraphic Address: "WHITELEY, HUDDERSFIELD." Nat. Telephone, 598 and 599.

Wm Whiteley & Sons Ltd

LOCKWOOD, HUDDERSFIELD.



SELF-ACTING MULE.

Makers of all descriptions of Tentering and Drying Machines.

Moore & Whiteley's Patent Wool and Cotton Dryer.

Crabbing or Winding-on Frames.

Cross Raising Machines, Wool Scouring Machines,

Hydro Extractors. Warp Sizing.

Cool Air Drying and Beaming Machines.

Warping Mills with Patent Sectional Dividing Apparatus.

Self-Acting Mules. Bobbin or Pirn Winder, &c., &c.

Mercerizing Machinery.

Second-hand Tentering Machines in good repair at low prices.

July, 1905, with a business growth to such an extent that more room is absolutely necessary.

At your service if you will

Call or write and I will

Oblige you with information of details and practical results on

Bobbin and cop winding and other machinery that is manufactured here and

Kept in touch with the requirements

Always producing the work that is correct,

Letting nothing go out

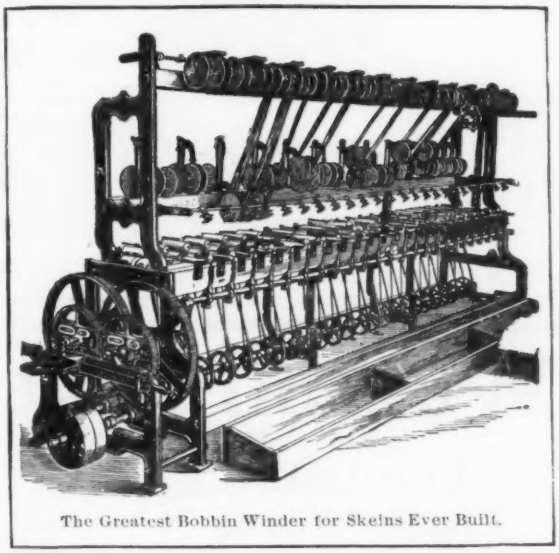
That is not satisfactory before delivery.

Every means are used to

Manufacture winders, spoolers, warpers, beamers and other textile machinery

Up to the standard of reputation

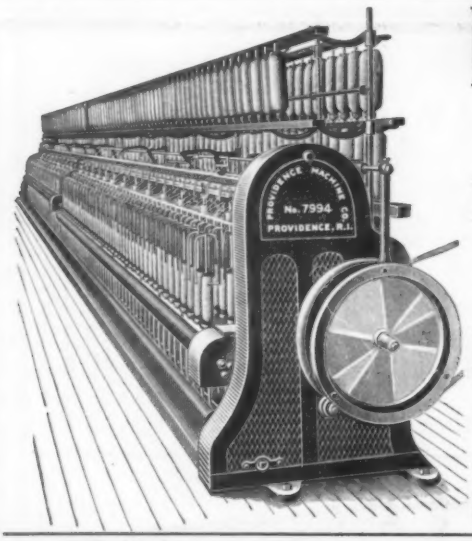
Secured by hard and earnest efforts and guaranted to give results satisfactory in every particular.



The Greatest Bobbin Winder for Skeins Ever Built.

Textile Machinery

2824 N. 4th St., Philadelphia, Pa.



Providence Machine Co.

Manufacturers of

Improved Cotton Roving Frames

Improved Worsted Roving Frames

564 Eddy St., - - PROVIDENCE, R. I.

An Essential to the Weave Room

WE ARE HEADQUARTERS

S. A. FELTON & SON CO. MANCHESTER, N.H. The Loom Duster

Watson Textile Motors

Eliminate Guess Work

Because they have been designed for the work by engineers who have made a careful study of textile conditions. Because they are adapted to the work, they do it better and more economically.

Watson Motor Driven Ventilating Fan Outfits are furnished with fans of either the straight or curved blade types.

Wound for any voltage.

ALL SIZES

WATSON TEXTILE MOTOR DRIVING VENTILATING FAN.

WATSON TEXTILE MOTORS

Manufactured by . . . THE MECHANICAL APPLIANCE CO., Factory: MILWAUKEE, WIS. N. Y. Office: 39 Cortlandt St.

ESTABLISHED 1828.

BOSTON BELTING CO.

ORIGINAL MANUFACTURERS
VULCANIZED RUBBER GOODS.

Rubber Covered Rollers

NEW ROLLERS COMPLETE. *ROLLERS RE-COVERED.*

We furnish Rubber Covered Rollers for all purposes for which such rollers are or can be used in Textile Mills. The quality of our rubber coverings is rigidly maintained at its well known high standard—resulting in satisfaction and the greatest economy to the user.

Rubber Belting

of superior quality for power transmission and the conveying of materials. Our large stock enables us to make prompt shipments.

Hose

all kinds for water, steam, air, fire protection, suction, etc. Our "AMERICAN UNDERWRITERS" Hose meets the requirements of all Insurance Companies.

The Trade-Mark of Excellence on all kinds of

HIGH GRADE MECHANICAL RUBBER GOODS

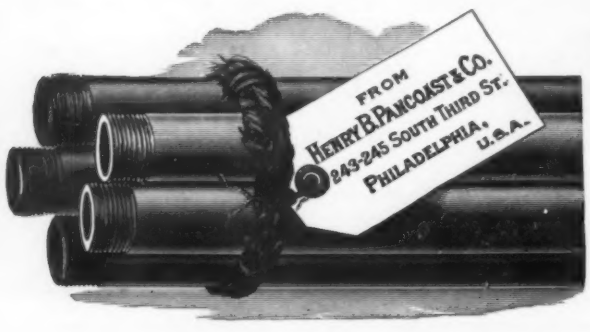
Pump Valves, Gaskets, Springs, Washers, Etc.

JAMES BENNETT FORSYTH, Mfg. Agt. and Gen. Mgr.

BOSTON. NEW YORK. BUFFALO. BALTIMORE. ATLANTA. NEW ORLEANS.

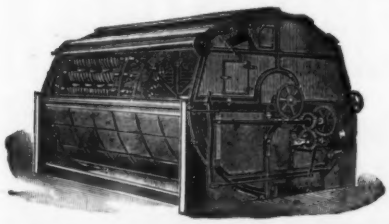
"STEEL MIXTURE"
BOILER DOOR ARCHES AND FIRE BOX BLOCKS
TONGUED & GROOVED

MANUF'D BY
McLEOD & HENRY CO.
INQUIRIES SOLICITED TROY, N.Y. U.S.A.



Manufacturers of and Dealers in
WROUGHT AND CAST IRON PIPE
for steam, water and gas.
BRASS, COPPER AND LEAD PIPE.
Iron and Brass Fittings, Valves, Etc.
Iron and Brass Railing and
Awning Fittings. . .
Steam and Hot Water Heating Apparatus.
Steam Specialties, Pipe Fitters' Tools, Etc.
PIPE CUTTING A SPECIALTY.

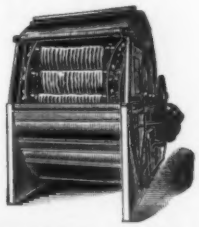
SKEIN AND SLUBBING MACHINES



SAVES

75% in Labor.
30% in Winding.
Steam and Dye Stuffs.
No Friction.
No Tangling.

CAPACITY
50 to 700 lbs per batch.



THE KLAUDER-WELDON DYEING MACHINE CO.

AMSTERDAM, N. Y.

Builders of Machines

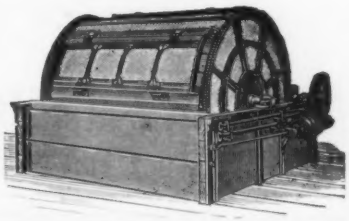
For Skein—Worsted, Slubbing, Cotton and Silk.
" " and Warp Mercerizing.
" Raw Stock Cotton, Wool, Waste and Rags.
" Garments Underwear, Hosiery and Caps
" Sulphur Colors—Raw Stock, Skein and Hosiery.

RAW WOOL AND COTTON MACHINES.

CAPACITY
200 to 1000 lbs per batch.

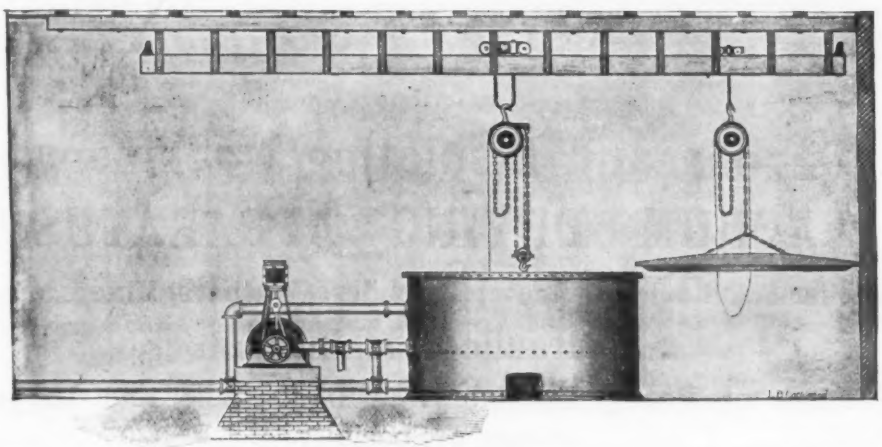
SAVES

50% in Labor besides Steam and Dye Stuffs. Practically indestructible. Leaves stock in perfect condition.



VACUUM DYEING MACHINE CO., CHATTANOOGA, TENN.

RAW STOCK, YARN AND HOSIERY DYEING MACHINES



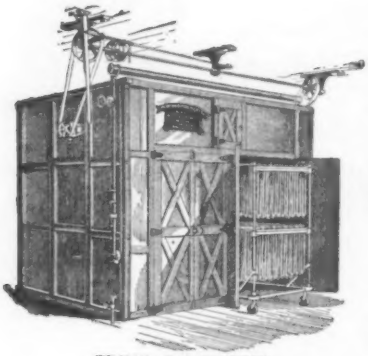
OFFICE OF TREMONT & SUFFOLK MILLS, LOWELL, MASS., Jan. 14, 1904.

VACUUM DYEING MACHINE CO., Chattanooga, Tenn.

GENTLEMEN: Replying to your inquiry in regard to what we think of your Raw Stock Dyeing Machine, would state that we have been using one about six months, with very satisfactory results, the dyeing being level, and the stock left in first-class condition for spinning. Can give your machine no better recommendation than to say, we think so well of it that we have just placed an order for two additional machines.

Yours truly J. J. CONNELL, Agent.

"20th CENTURY" MACHINERY

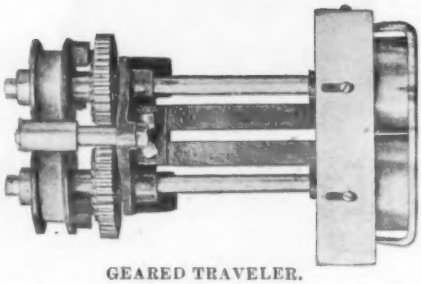


TRUCK YARN DRYER

Dryers for Wool and Cotton Stock, Yarn, Stockings and Underwear.

Carbonizers, Yarn and Wool Scouring Machines.

Ventilating Fans, Bleachers.



GEARED TRAVELER.

We also manufacture Kershaw's Geared Traveler and Improved Web Feed.

DYEING MACHINES, TOM TOMS, CHROMING, WASHING AND OXIDIZING MACHINES.

AMERICAN DRYING MACHINERY COMPANY,

19th AND WESTMORLAND STREETS, PHILADELPHIA, PA.

AITON MACHINE CO.

ENGINEERS AND MACHINISTS

GARDINER C. SIMS, President.
THOS. A. AITON, Vice President.
ARTHUR S. BEVES, Sec. and Treas.

126 Liberty Street,
NEW YORK.
Factory,
HARRISON, N. J.

Manufacturers of

Cabling and Insulating Machinery

VACUUM DRYING APPARATUS

Rubber Machinery, Including Calenders, Washers, Mixers, etc.

Hydraulic Machinery

Builders of Heavy Machinery. High Grade and Large Castings a Specialty.

INQUIRIES SOLICITED

HARWOOD'S MACHINERY

Increases Production, Improves Quality, Decreases Labor Cost.

THE BRAMWELL SELF-WEIGHING FEEDER,

For Woolen, Worsted, Hosiery and Shoddy Cards and Garnett Machines.

We began introducing this feeder more than twenty years ago and its use is now practically universal. Many other types and makes have been tried and discarded, but the Bramwell, in its improved and up-to-date form, is now recognized everywhere as the most perfect feeder and only complete feeding machine in the world.

Our long experience has proved conclusively that where evenness is required—determined by weighing—our weighing feature is absolutely indispensable. Several attempts have been made to introduce feeding machines ignoring this principle, but none have succeeded.

We have made a careful study of all phases of the feeding problem and by adaptations and modifications of the Bramwell Feeder to meet the particular conditions, are prepared to feed evenly all kinds of stock from rabbit's fur to jute tow, including shoddy, cotton, fine wool, mixtures, fine and coarse worsted, flax tow, long worsted and all other kinds of stock.

Call on us for particulars and information about all matters relating to Feeding Machinery.

GEORGE S. HARWOOD & SON,

53 State Street, Boston, Mass.

Cool and Healthy Operatives

turn out more and better work and thus earn more money for employers

This is one more reason why so many of our leading mills are installing

Barney Compound Ventilating Fans

which remove impure air, dust, smoke, gases, etc., and bring in any desired quantity of pure fresh air.

We are experts in Ventilation, Heating, Cooling and Drying. Our long practical experience and Barney Fans form a combination that produces the right results.

Ask us for more facts and names of firms, corporations, municipalities and individuals for whom we have executed difficult orders.

BARNEY VENTILATING FAN WORKS,

Albert B. Franklin, Proprietor. 165 Fort Hill Sq., Boston, Mass.

P. & C. GARNETT, Ltd.

Telegrams "Garnett" Cleckheaton

Wharfe Works, Cleckheaton (Yorks), England

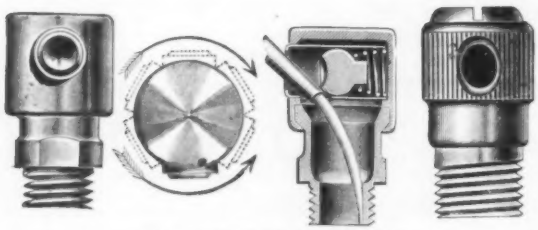
ORIGINAL PATENTEES AND MAKERS OF

The "Garnett" Machine or Waste Opener

Also The GARNETT Patent Knot-Breaker or Preparer.

For preparing waste for the Garnett Waste Openers, breaking knots and other hard substances, old ropes, bagging, etc. No waste puller should be without this most valuable machine which saves the fine clothing of the Garnett Machine.

Original makers of Garnett or saw-tooth wire, in best Swedish Iron, and Cast Steel, with points hardened by electricity. .... Burr Rollers, Breasts for Woolen Cards, Lickerin Rollers, Rag Machines.



Do You Know

that a machine with no protection from dust and grit in the oil holes leading to a bearing is headed for the scrap heap?

DELAY THE DEMISE

USE

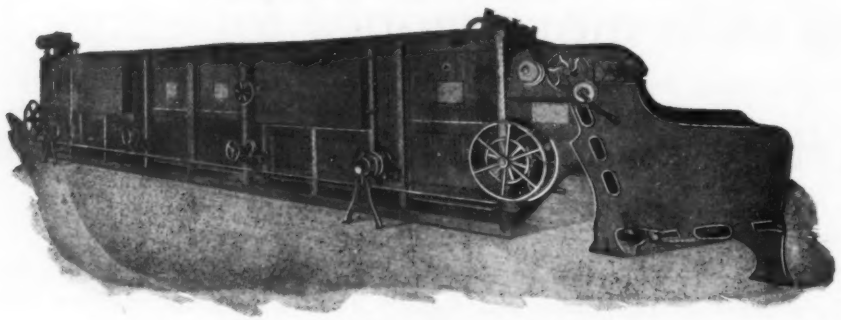
TUCKER DUST PROOF OIL CUPS

POSTAL WILL BRING SAMPLE.

W. & C. F. TUCKER, HARTFORD, CONN.

C. G. SARGENT'S SONS,

GRANITEVILLE, MASS.



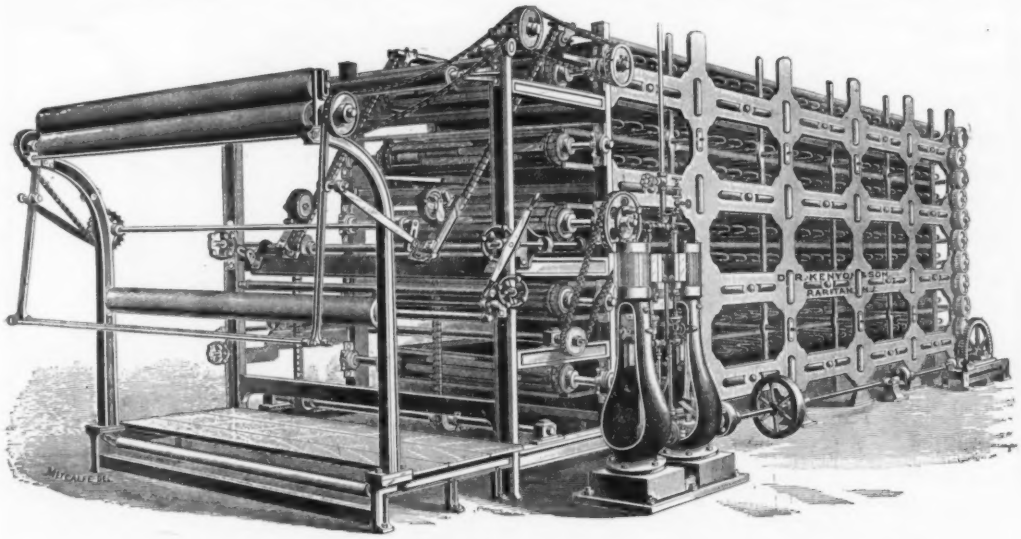
... BUILDERS OF ...

Stock Dryers, Wool Washers,
Wool Dusters, Carbonizing Plants,
Burr Pickers, Etc.

Tentering and Drying Machines

WITH LOW DOWN FEED. PATENTED FEBRUARY 26, 1895.

Tentering and Drying Machines on Pipe System. Special Dryers for Heavy Felt Goods. Hot Air Drying and Tentering Machines.



Fulling Mills, Washers, Chinchilla and Whitney Machines, Whipping Machines, Cone Willows, Marsden & Blamire Lap Feed, Dyeing Machines for Piece Goods, Soaping Machines, Wringing Machines, Jigs, (double or single,) Dewing Machines, etc.

MANUFACTURED BY

D. R. KENYON & SON,

SUCCESSORS TO KENYON BROS.

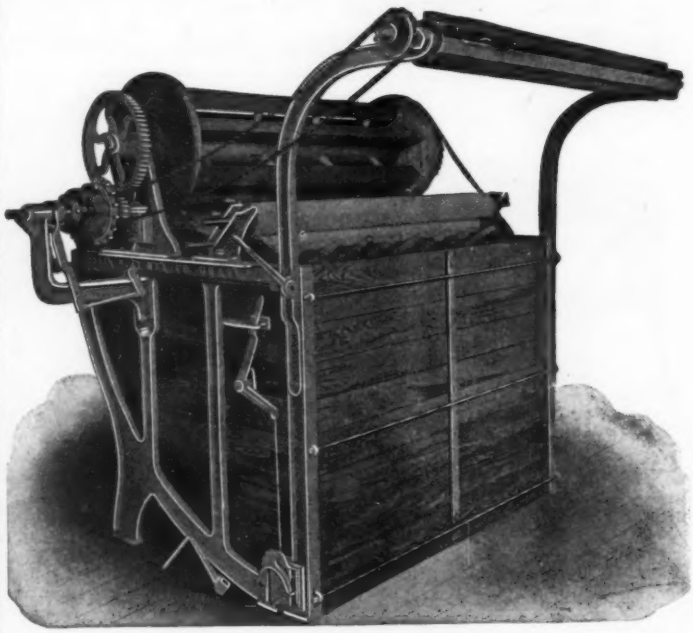
Long Distance Telephone, Somerville 40-B.

RARITAN, N. J.

RODNEY HUNT MACHINE COMPANY

WATER WHEELS,
Horizontal and Vertical.
Iron Flumes and Penstocks.
Rotary Fire Pumps.
Centrifugal Pumps.
Head Gate Apparatus.
Water Wheel Regulators.
Rotary Fulling Mills.
Rotary Cloth Washers.
Rotary Knit Goods Washers.
Combined R'y Fulling Mill and Washer for Knit Goods.
Endless Felt R'y Washers and Rotary Felling Mills.
Hammer Falling Stocks.
Dolly Washers.
Crank Fulling Mills.
Crank Knit Goods Washers.
Wringing and Rinsing Mchs.
Reel Dyeing Machines.
Carbonizing Machines.
Bleaching Machines for Chloride of Lime and Peroxide of Sodium,
Dye Tubs and Rinsers.
Wool Washers.
Soaping Machines.
Cloth Winders.

New Dyeing Machine



TYPE L. FOR CLOTH AND KNIT GOODS IN THE PIECE.

TYPE M. FOR BLEACHING COTTON KNIT GOODS, CIRCULAR No. 16.

Boston Office,
70 KILBY STREET,
Telephone No. 1522.

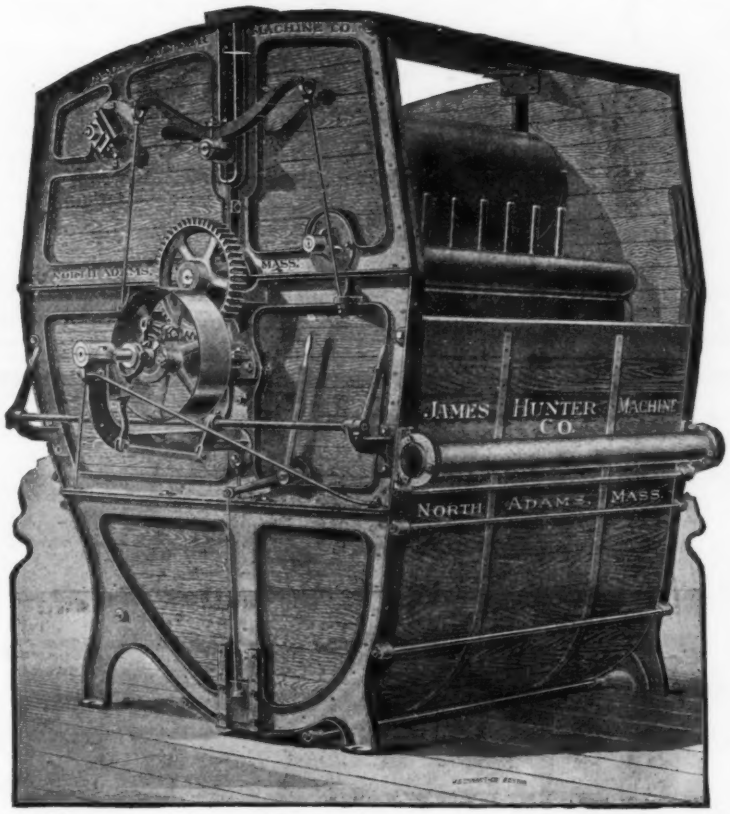
Main Office and Works,
ORANGE, MASS.

Automatic Wool Washers

PARALLEL RAKE

The "STONE DRYER," for Wool, Cotton, Rags, Etc.

CARBONIZING MACHINERY, ETC.



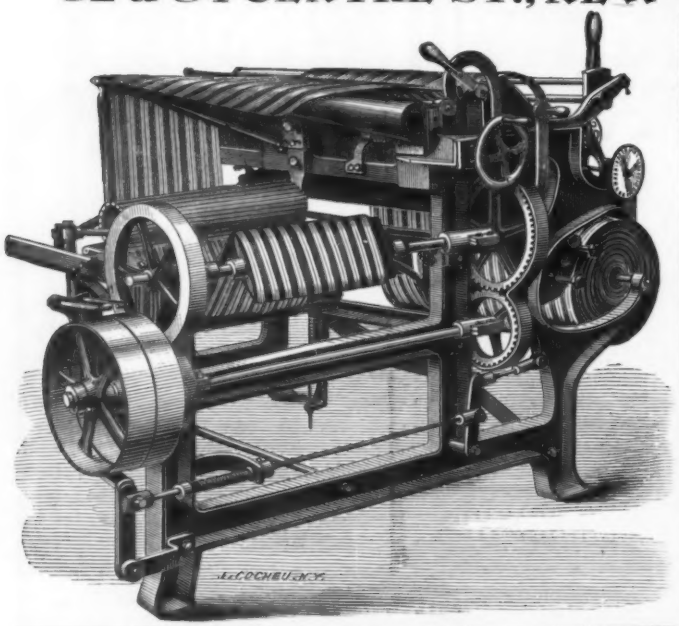
Fulling Mills, Cloth Washers,

WOOL OPENERS, SELF FEEDS, DUSTERS

JAMES HUNTER MACHINE COMPANY, NORTH ADAMS, MASS.

Fabric Measuring & Packaging Co.

82 & 84 CENTRE ST., NEW YORK, U.S.A.



Machines to Print Trademarks

On Cottons, Woolens and Carpets.

Machines to Measure

and imprint the measurement upon fabrics, fold lengthwise and roll into merchantable packages all in one operation.

Prevents claims for short measure.
Marks piece numbers on each package.

A Fully Equipped Machine Shop for General Work.

Patented in the United States and Foreign Countries.

SEND FOR BOOKLET.

The American

WROUGHT STEEL

PULLEY

Is a parting PULLEY and can be applied without stripping the shaft.
It is Light, STRONG, and lasts a lifetime.
It clamps to the shaft perfectly — keys and set-screws superfluous.
Interchangeable metal Bushings to fit shafts of different sizes.
Particularly adapted to TEXTILE manufacturing.

Sold by the Leading Supply Houses all over the WORLD.

The American Pulley Co.,

29th and Bristol Streets, : : PHILADELPHIA, PA.

On How to Economize Fuel.

IF you were a railway manager and knew that every conductor on your road regularly "knocked down" 15 per cent. of the fares collected, you would lie awake nights. However, your boiler plant does as much (needlessly wastes 10 to 20 per cent. of the heat value of the fuel) if it is not provided with a Green Fuel Economizer.

If you will take the temperature of the gases leaving your boilers (400° to 700° F., according to the boiler and method of firing), and remember that this heat could be utilized in heating feed water up to the boiling point, you will be ready to believe this. Moreover, exhaustive scientific tests by well known engineers—Dean & Main, Geo. H. Barrus and others—conclusively prove that it is true and that you are needlessly sending 10 to 20 per cent. of your coal pile up the chimney. Of course, these remarks do not apply if you are one of the thousands of well-satisfied users of Green Fuel Economizers whose names we have published.

That isn't all. You do not worry about the "peak" or sudden demands for power when you know that the Green Fuel Economizer contains several times your boiler capacity of water at the boiling point, ready to be turned into steam the moment the drafts are open. You do not worry about the boilers when you know they are not being injured by having cold water pumped into them, and when you know that sediment that would otherwise incrust them is being precipitated in the Green Fuel Economizer.

Send postal for a book giving tables, formulæ and drawings of Economizer plants and everything required to understand this subject thoroughly. Ask also for our Catalog "T W" of Fans, Blowers and Exhausters.

The Green Fuel Economizer Co.,

Matteawan, N. Y.

DO YOUR **BELT LACING** RIGHT—

GET A **JACKSON**

BELT-LACER

as the best equipped Textile Mills, Cotton Mills and Woolen Mills are doing—it pays to be able to lace a 5″ belt in less than 3 minutes at a cost of one cent—larger belts in proportion.— The Jackson Belt Lacer will do it—and do it in such a way that the belt can be connected or disconnected, shortened or lengthened in a few seconds. Catalog.

BIRDSBORO STEEL FOUNDRY & MACHINE CO.

Formerly the DIAMOND DRILL & MACHINE CO.

Birdsboro, Pa. and 52 Broadway, New York.

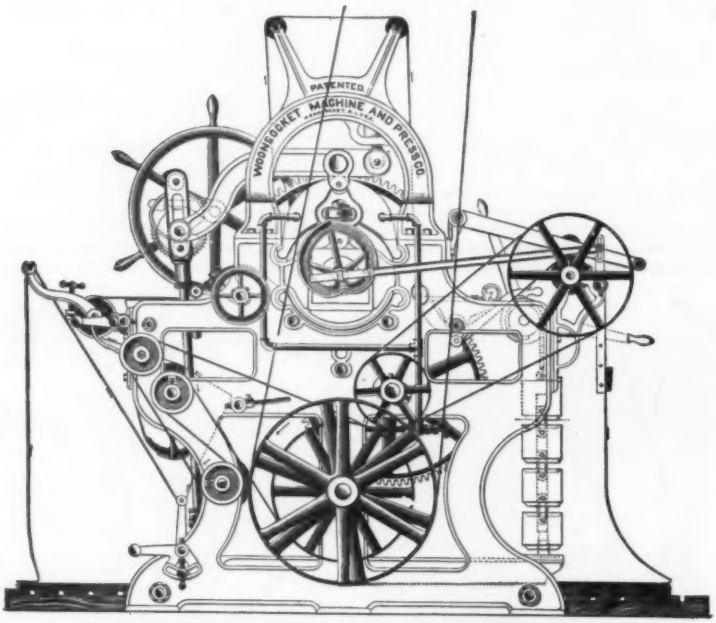
Agents: E. A. Kinsey & Co., Cincinnati, O.; Charles H. Besley & Co., Chicago, Ill.; W. R. Colcord Machy Co., St. Louis, Mo. Foreign Agents: Selig, Sonnenthal & Co., 85 Queen Victoria St., London, Eng.; Wilh. Sonnenson & Co., Malmo, Sweden; Jean Braun, Moscow, Russia; Teodoro Koelliker, Milan, Italy; J. Lambercier & Co., Geneva, Switzerland; R. S. Stockvis & Son, Rotterdam, Holland.

Best Patent Steam Rotary Cloth Press

Four Separate Pressings In One Machine!

The Only Press that has Self-Yielding Beds with Four Points of Contact

PERFECT TEMPERATURE, POWERFUL, SIMPLE



THE WOONSOCKET ROTARY PRESS.

Woonsocket Machine and Press Company

WOONSOCKET, R. I,

EASTON & BURNHAM MACHINE CO.
PAWTUCKET, R. I.

SPOOLING & WINDING
MACHINERY

TEXTILE ART PRESS, N.Y.

WM. FIRTH, Pres. EDWIN BARNES, Vice-Pres. JOHN H. NELSON, Treas.

WILLIAM FIRTH CO.

Post Office Square Building, 79 Milk Street, BOSTON, MASS.

. . . SOLE IMPORTERS OF . . .

ASA LEES & CO., Limited,

TEXTILE MACHINERY,

OF EVERY DESCRIPTION FOR COTTON, WOOLEN AND WORSTED.

SOLE AGENTS FOR

JOSEPH STUBBS, Gassing, Winding and Reeling Machinery for Cotton, Worsted and Silk.
GEO. HATTERSLEY & SONS, LTD. Makers of Every Description of Looms, etc.
JAMES MACKIE & SONS, LTD., Makers of Flax, Tow, Hemp and Jute Preparing and Spinning Machinery.
GEORGE ORME & CO'S Patent Hank Indicators, etc.
JAMES YATES & SON, Hardened and Tempered Steel Card Clothing for Woolen and Worsted Cards.
LOCKETT, CROSSLAND & CO., Engravers and Builders of Leather Embossing Machinery, etc., etc.
R. CENTNER FILS, Heddles.
GOODBRAND & CO., Yarn Testing Machinery, Wrap Reels, etc.
JOSHUA KERSHAW & SON, Roller Skins, etc.
GEORGE SMITH, Doffer Combs, etc.
BRADFORD STEEL PIN CO., Comber Pins.
CLAPHAM, SMITH & CO., Caps, Tubes and Spindles for Worsted, etc.

ALSO AGENTS FOR

JOSEPH SYKES BROS., Hardened and Tempered Steel Card Clothing for Cotton.
WILLIAM TATHAM & CO., Waste Machinery.
DRONSFIELD BROS., Limited, Emery Wheel Grinders, Emery Fillet and Flat Grinding Machines.
COTTON CORD AND VELVET CUTTING MACHINE CO., Corduroy Cutting Machines, etc.

PICK GLASSES, LEATHER APRONS, PATENT WIRE CHAIN APRONS.

LONG AND SHORT BOBBINS.

Why not lengthen out your Flyers? We can change your 6 in. Flyers to 7 in., or your 7 in. to 8 in. The most successful mills are using LONG BOBBINS. Why will it not mean success for you? Give your frames more lift, lengthen your Flyers, this means more PRODUCTION and less WASTE.

BAKER MACHINE CO., New Bedford, Mass.

Steel Rolls Repaired, Brass Comber Rolls, Bodden Flyers and Pressers.

Vulcan Fibre Roving Can.

BODY—Vulcanized Fibre. SIDE SEAM—Riveted with Patented Clinched Rivets. RINGS—Tinned Steel, Brazed Joints, Curled Edges. BOTTOM—IXXX. Tin Star Corrugation; Fastened without the use of nails or screws, will not crack, warp or shrink and cannot come out. FINISH—Coated inside and out with moisture proof coating, handsome and smooth. WEIGHT—About one-half pound per inch diameter. SIZE—All cans to any exact size, perfectly round and true. DURABILITY—Superior to any other can.

Also Manufacturers of

HILL'S IXXX TIN AND GALVANIZED IRON DYE HOUSE CAN.

James Hill Manufacturing Co.,

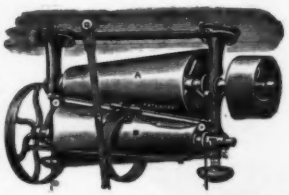
PROVIDENCE, R. I.

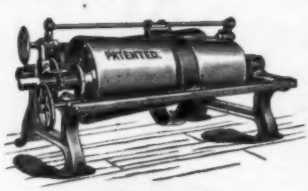
EVANS' FRICTION CONES.

Eight Thousand Sets in Operation in This Country and Europe.

A partial list of manufacturers who have Evans' Friction Cone Pulleys in operation, transmitting from ONE TO FORTY HORSEPOWER:

National Biscuit Co., Richmond, Ind., 300 sets. Merrimack Mfg. Co., Lowell, Mass. 20 sets. Arnold Print Works, No. Adams, Mass., 11 sets. John & James Dobson, Philadelphia, Pa., 34 sets. Stinson Bros., Philadelphia, Pa., 40 sets. Frederic J. Falding, New York, N.Y., 20 sets.





Smith & Winchester Co., So. Windham, Conn., 250 sets. Furguson & McRae, Belfast, Ireland, 25 sets. Mercantile Laundry, So. Windham, Conn., 250 sets. Washburn & Moen, Worcester, Mass., large number, all sizes. Dennison Tag Co., Boston, Mass., large number, small sizes. Saco & Pettee Machine Co., Newton, Mass., 275 sets. Pacific Mills, Lawrence, Mass., 13 sets.

Send to G. FRANK EVANS, 1288 Center Street, Newton Center, Mass., for Illustrated Catalogue.

ESTABLISHED 1816

DRAPER COMPANY

INCORPORATED 1896

WILLIAM F DRAPER, Pres't
J.B. BANCROFT, Vice Pres't
GEORGE A. DRAPER, Treasurer
EBEN S. DRAPER, Agent
GEO. OTIS DRAPER, Secy.
E. D. BANCROFT, Purchasing Agent
FRANK J. DUTCHER, Asst. Agent

HOPEDALE, MASS Aug. 3, 1905

Frank B. Comins, Treas.
AMERICAN MOISTENING COMPANY
79 Milk Street, Boston, Mass.

Dear Mr. Comins:-

Referring to the use of your humidifiers, will say that some twelve years ago when we started an experiment weave room to exploit the advantages of our Northrop loom, we tried all the humidifying systems then presented to the trade, in order to find out which was best suited to our needs. As you well know, we finally decided on your own system, and I believe that the majority of the Northrop loom mills in the country are also using the same. We believe in a thorough humidification of the atmosphere in weave rooms for we wish to see weaving made as automatic as possible, and there is no question but that warp breakage is considerably diminished if the warp is kept in a properly moistened condition.

Yours very truly,

George Otis Draper

THE CLARK THREAD COMPANY

NEWARK, NEW JERSEY Aug, 9, 1905

ALL CORRESPONDENCE MUST BE ADDRESSED TO THE COMPANY

AMERICAN MOISTENING CO.,
79 Milk St.,
Boston, Mass.

Dear Sirs:-

In answer to yours of Aug. 1st, we beg to state that we have three of your Moistening Systems in our mills which are giving entire satisfaction. We also beg to state that we spin from No. 10s to No. 150s. Before installing this system we used live steam, which was very disagreeable.

We cheerfully recommend your system to anyone wishing to humidify their plant, as a cheap and first-class system.

Yours truly,
The CLARK THREAD CO.

W. Campbell Clark
Pres't.

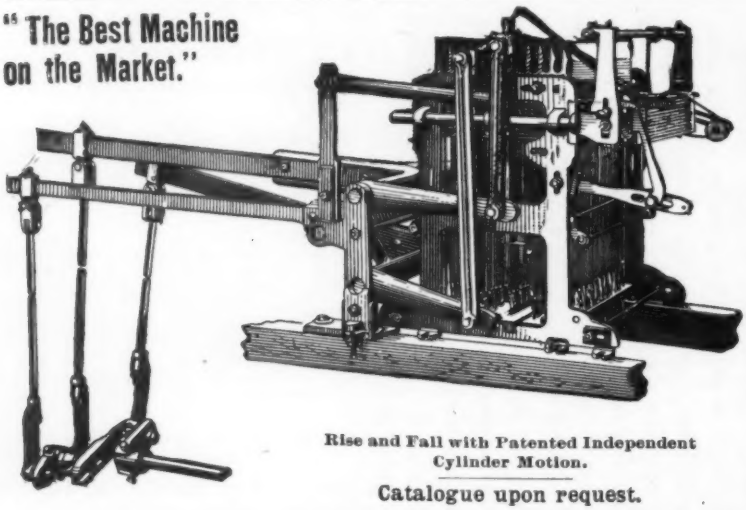
NEWARK, N. J., Jan. 27, 1902.

American Moistening Co., 150 Devonshire St., Boston, Mass.

Dear Sirs:—It gives us great pleasure to recommend your Drosophore System. We have three installations of it and it has never given us any trouble whatsoever. Before putting in your System, on cold, dry mornings it was impossible for us to start up our Combers, etc., until we had moistened the room with live steam, which was very disagreeable. We cannot endorse this System too highly for all textile manufacturers.

Yours truly,
THE CLARK THREAD CO.
(Signed) W. Campbell Clark, V. P.

"The Best Machine on the Market."



Rise and Fall with Patented Independent Cylinder Motion.

Catalogue upon request.

USE THE

HALTON JACQUARD

Original Fine Index Machines

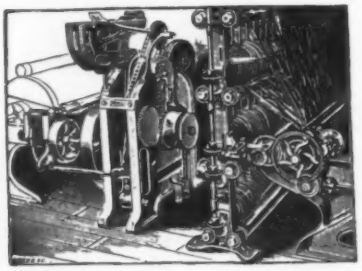
Single Lift, Double Lift, Double Cylinder, Rise and Fall, Crossborder.

THOMAS HALTON'S SONS,

Allegheny Avenue and C Street,

PHILADELPHIA

Representatives
H. A. Forbes, Paterson, N. J.
Alexander & Garsed, Charlotte, N. C.



TORRANCE MFG. CO.,

HARRISON, N. J.

TORRANCE PATENT AUTOMATIC BALLING MACHINE

With all the latest improvements for Wool Cards. The latest and best and only Feed that will make yarn positively even.

ALSO

CHOQUETTE WASTE SAVER. Saves card fly.

Write for particulars.

L. B. BRAINERD, President. F. B. ALLEN, Vice-Pres't. J. B. PIERCE, Secretary. L. F. MIDDLEBROOK, Ass't Secretary.

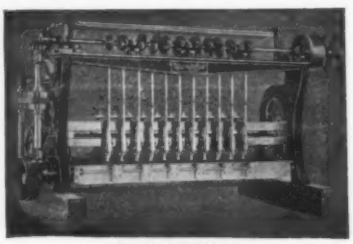
HARTFORD STEAM BOILER INSPECTION AND INSURANCE CO. HARTFORD, CONN.

NEW ENGLAND DEPARTMENT
101 MILK STREET,
BOSTON, MASS.

STEAM USERS of this country have upwards of 90,000 Steam Boilers under the inspection and insurance supervision of this company.

C. E. ROBERTS, Manager.

W. H. ALLEN, Ass't Manager.



50-IN. MACHINE

L. F. FALES

MANUFACTURER AND BUILDER OF

SEWING Manhplex MACHINES

FOR ALL PURPOSES WHERE A NUMBER OF ROWS OF SEAMS ARE REQUIRED

BUILT WITH ANY REQUIRED NUMBER OF NEEDLES.

DESIGNER OF SPECIAL MACHINERY | WALPOLE, MASS. U. S. A. | PAPER SLITTING MACHINES

The Metallic Drawing Roll Co.

INDIAN ORCHARD, MASS.

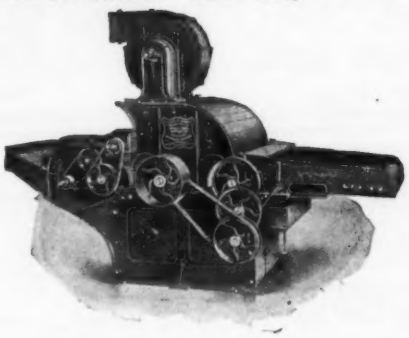
MANUFACTURERS OF

Metallic Rolls

Especially adapted for Cotton Mills. 25 to 33 per cent more Production Guaranteed. Weight Reduced 33 to 50 per cent. No Leather Covering Bill.

WRITE FOR PARTICULARS.

CURTIS & MARBLE MCH. CO., WORCESTER, MASS.



BURR PICKER.

Wool Burring and Picking Machinery.

Cloth Finishing Machinery.

R. H. HOOD,

Successor to THOMAS RAMSDEN,

Maker of

Worsted Machinery,

For Preparing, Finishing Gills and Drawing Boxes

New Screws made and old ones repaired and thoroughly case-hardened

Repairs and new parts for curled hair machinery. Fallers of every description made. Change Gears, 5-8, 7-16, 3-8 and 1-4 inch pitch kept on hand. All kinds of new Fluted Rollers, for Combs, Gills, Drawing and Spinning; also Refluting old ones. Improved Roller Covering Machine.

1842-44-46 GERMANTOWN AVENUE, PHILA., PA.

FRANK B. KENNEY, Manager.

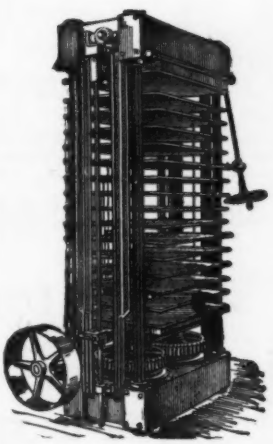
T. C. ENTWISTLE COMPANY

LOWELL, MASS.

WARPING, BALLING AND BEAMING MACHINERY

PATENT EXPANSION COMBS

Southern Agent, STUART W. CRAMER, Charlotte, N.C.



Reliance Hot Plate Press

For Hosiery and Underwear Trade.

For price and particulars address

CHARLES HART

Hedge and Brown Sts., Frankford, Phila., Pa.

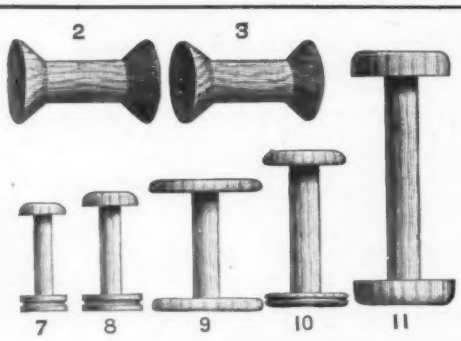
JOHN M. DEAN,

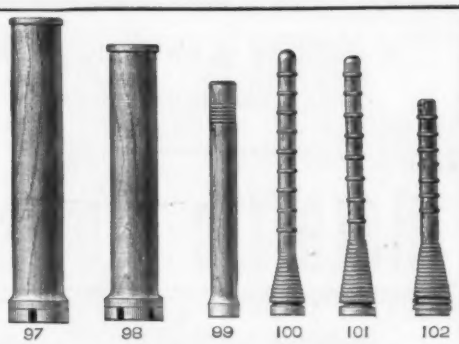
MANUFACTURER OF

Hackle, Gill, Card and Comb Pins. Comber Needles all sizes.

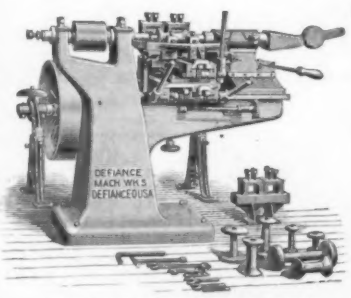
Carrying Combs, Porcupines, Tenter Plates, Gills, Fallers and Flat Pins of Every Description. Circle and Faller Repairing and Repinning. Weavers Pick Out Comb Pins.

Tanner Street, Corner St. Hyacinth, Lowell, Mass.



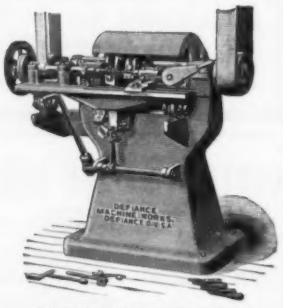


SPOOL AND BOBBIN MACHINERY



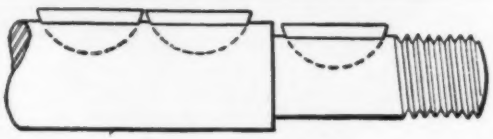
AUTOMATIC SPOOL TURNING LATHE

Complete Equipment
OF THE
MOST MODERN TOOLS
25% SAVED
Over the Old Methods
Send for Catalogue and Particulars to
THE
Defiance Machine Works,
DEFIANCE, OHIO



AUTOMATIC BOBBIN LATHE

Key Seating Attachment
FOR
Whiton Gear Cutter



We offer an attachment for use with our Gear Cutting Machine, to cut key seats for the Woodruff System of Keying. Write for description, circulars and price.

THE D. E. WHITON MACHINE CO.,
19 Oak Street, New London, Conn.

This Trade Mark on every package.

Look out for YELLOW Label.

Reg. U. S. Pat. Of.

There is only **ONE**

ALBANY GREASE

AND WE ARE THE ONLY MAKERS.

We have solved the problem of economical lubrication.

Cost of using oil

Cost of using Albany Grease

OUR SPECIAL OFFER, a Sample Can of Albany Grease with an Albany Grease Cup free of charge or expense for testing. The only information necessary to send is pipe connection in bearing, DEPTH OF OIL HOLE FROM TOP OF TAP TO JOURNAL, and give particular part of machinery on which the same is to be used.

ADAM COOK'S SONS, 313 West Street, New York City, U. S. A.

The Bell System of Humidification

Produces and automatically maintains throughout the year the uniformity of conditions that every textile manufacturer desires and now finds it so hard to realize. These conditions he can never get by squirting steam or water into his rooms and trusting to luck.

The whole trend of modern manufacturing is toward trusting more in the machine and less in the man. For this reason all auxiliary apparatus should be as nearly automatic as is possible.

The Bell Humidifier delivers air carrying moisture as aqueous vapor, just as it is found in nature, which moistens thoroughly and uniformly. Being SELF-REGULATING, it does not keep on moistening when further moistening is useless or harmful.

BELL PURE AIR & COOLING CO.

97 CEDAR STREET, ... NEW YORK, N. Y.

Cloth Washers, Dye Tubs, Vats, Fulling Mills,
Piece Dyeing Machines, Special Machinery,
Brass Founders, Tanks, To Order.

Hopkins Machine Works, Inc.

BRIDGETON, R. I.

Providence Office, 49 Westminster St.

Spindles and Flyers, for Cotton, Wool, Silk, Flax, etc.

Send for our latest Catalogue and Price List

Dye Tub Valves, Cloth Guides, etc. Bronze or Porcelain Rings.

ANYTHING

Entire Outfits for New Mills, or small and odd items that that you don't know just where to obtain, can be found at the

AMERICAN SUPPLY CO.,
PROVIDENCE, R. I.

in Mill Supplies.

ASHWORTH BROS.,

—MANUFACTURERS OF—

Card Clothing of Every Description

FALL RIVER, MASS.

E. L. TEBBETS & CO.,
Locke's Mills, Me.

Thread and Silk **SPOOLS** of any description made from one piece, up to 6" long and 3 dia.

We are located in the best white birch region. Our work and prices seem to satisfy the most particular customers. We can give any finish desired. Estimates furnished on samples submitted.

DUCK AND TICKING

LUG STRAPS

We carry in stock ready for immediate delivery all ordinary sizes of duck and ticking lug straps, and promptly make to order any which are out of the ordinary. Our straps are as good as the best material and the most careful workmanship can make them.

Garland Mfg. Co.
(*Formerly Loom Picker Co.*)
Saco . . . . Maine

WARD & VANDEGRIFT,

Successors to The Bridesburg Mfg. Co.

In the Manufacturing of **SPINDLES,**

For Cotton, Woolen, Worsted, Silk and Flax Machinery. Manufacturers and Repairers. Also Flyers, Steel Caps, Bolsters, Steps, Tubes, Etc.

ELMER, SALEM CO., .. N. J.

TEXTILE MACHINE WORKS

THUN & JANSSEN, READING, PA.

Manfrs of *BRAIDING MACHINES*

for making Dress Trimming Braids, Cotton Tapes, Underwear Braids, Shoe Laces, Spindle Banding, etc. Winders, Doublers. Measuring Machines, Reelers, Singeing and Finishing Machinery. Special Machinery.

The J. L. N. Smythe Co.

Leather Fibre S Manilla

23-25 So. 4th St., Phila.

Paper Specialties,

Fibres, Colored Textile Wrappers,

Manillas, Silk Papers, and Tissues, Corrugated Cloth Boards.

JOHN B. DEWSNAP & CO. - 3 CEDAR STREET NEW YORK

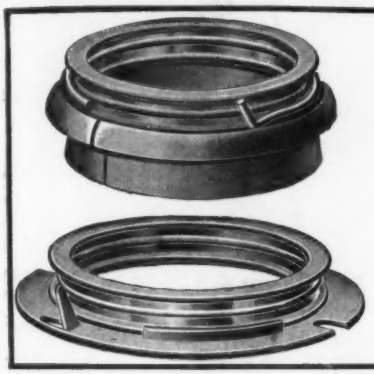
IMPORTERS OF HIGH GRADE **OLIVE OILS**

Especially for the Textile Trade. Yellow and Green Olive Oil, also Olive Oil Foots. We guarantee all our oils Pure Olive Oil. Samples and quotations furnished on request

BLEACHING
DYEING
FINISHING
MACHINERY

ARLINGTON MACHINE WORKS
ARTHUR BIRCH
ARLINGTON HEIGHTS, MASS.

CRABBING
OPENING
SEWING
MACHINES



The Best That Money Can Buy

SPINNING RINGS.
TWISTER RINGS.
RING HOLDERS.
TRAVELER CUPS.
SILK RINGS.
TRAVELER CLEANERS.

Correspondence Solicited.

WHITINSVILLE SPINNING RING CO.,
WHITINSVILLE, MASS., U. S. A.

JACOB WALDER,
Paterson, N. J.

Sole Manufacturer in the United States of
Liberal Discount to Dealers.

Brass and Steel **MAILS**

Have you seen the NEW PROTECTOR for PIN TICKETS?

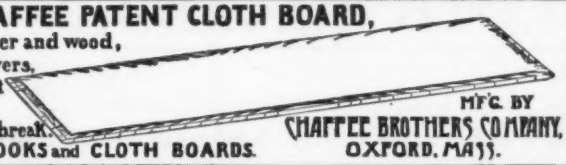
Its the Niagara "Pin Kap"

The most simple little device for protecting all makes of Pin Tickets. Protects your fingers. Protects the samples. Ask us about them.

NIAGARA CLIP CO., - 38 Park Street, New York.

SAVE
Their Cost
In Freight.

THE CHAFFEE PATENT CLOTH BOARD,
Made of paper and wood,
Needs no covers,
Will not split or warp;
Not liable to break.



MFG. BY
CHAFFEE BROTHERS COMPANY,
OXFORD, MASS.

BOX SHOOKS and CLOTH BOARDS.

Clean
LIGHT
Strong

Shaw's "Victor" Travelers
Manufactured by
VICTOR SHAW RING TRAVELER CO.
Incorporated 1899.
23 Sabin Street, PROVIDENCE, R. I.

Products for
WOOLEN
LINEN
COTTON
KNITTING and
SILK MILLS

Sizings

The
Warren Soap Mfg. Co.
BOSTON, MASS.
Established 1870 Incorporated 1890

Softeners

BLEACHERS
DYERS and
CALICO
PRINTERS'
SOAPS

Established 1870

John Heathcote & Son

Providence, R. I.

Builders of Improved

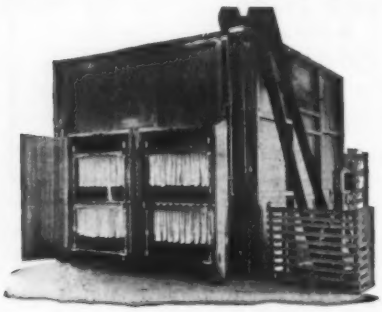
Cloth Tentering and Drying Machinery

for WOOLENS, WORSTEDS, FELTS, etc.

Built Upright or Horizontal with Low Down Feed

Ventilating Fans a Specialty

Send for Catalogue



FRANK BAILEY,

BUILDER OF

YARN DRYING MACHINERY

ON THE

COLD AIR SYSTEM. Simple, effective, inexpensive. Leaves yarn in beautiful condition.

ALSO ON THE

HOT AIR SYSTEM when great capacity is wanted.

DYE STICKS, Kettle Sticks and dry and sulphur house Poles, also Sticks to suit the Wolstenholm Machine from natural water grown cedar, and Sticks to suit the Klauder-Weldon, Lorimer and Hussong machines from finer grades of lumber. These Sticks have been thoroughly tested, and pronounced the best on the market. Guarantee satisfaction to buyers. Write for prices.

Works at Braddock, P. O. Address, Cedar Brook, Camden County, N. J.

PAPER BOARDS

For Textile Mills

Largest Makers of

CLOTH BOARDS

PERFECT RIGID CLOTH BOARD TRADE MARK

LIGHTNESS STIFFNESS ECONOMY

Quotations by count or weight in any Quantity. Prompt Delivery.

J. K. SHRYOCK, 19 So. Seventh St., Philadelphia, Pa.

J. N. DYSON, Manager.

KEEP YOUR ON THIS SPACE

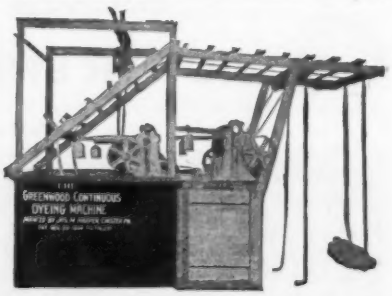
Important to Manufacturers

Manufacturers who want to **LIVE.**

Also to those who want to **DYE.**

GREENWOOD WARP DYEING MACHINE

For Sulphur Colors.

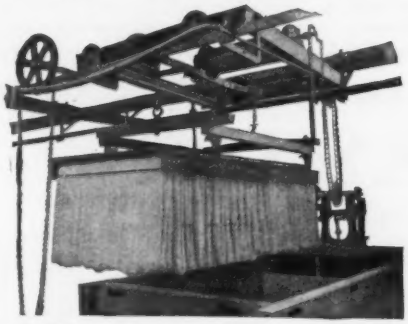


Built by THE HARPER MANUFACTURING COMPANY, Chester, Pa.

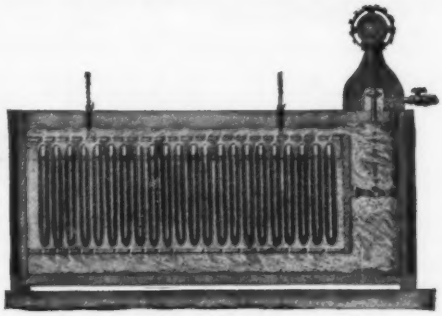
The Hussong Dyeing Machine

Patented Nov. 6, 1900. April 9, 1901. Nov. 29, 1904.

A PERFECT SKEIN DYEING MACHINE



This illustration shows our Compressed Air Hoisting Carriage, with 300-pound Yarn Machine suspended.



Longitudinal Sectional View, showing the circulation of dye-liquor through the yarn when in operation.

Points of Superiority Which We Claim for the Hussong Machine.

Durability, Even Dyeing, Saving of Steam, Saving of Dyestuff,
Saving of 75% in Labor. Makes No Waste Whatever. No Friction on the Material,
Requires but Little Power to Operate,
Leaves the Yarn and Slubbing in its Natural Condition.

Built by the **American Dyeing Machine Co., Office 609 Pearl St., Camden, N. J.**

BEWARE OF INFRINGEMENTS.

THE COHNEN

CENTRIFUGAL

Dyeing Machine

U. S. Patent 776,295, Nov. 29, 1904.

Dyes Raw Stock
or
Yarn in Cops, Skeins or Bundles (Warps)

DYES SULPHUR COLORS

without bronzing or streaking and leaves the stock in perfect condition for carding or weaving.

ONLY ONE HANDLING

is required to dye, oxidize and hydro extract ready for the drying room.

The Machine may be seen in operation by applying to the American Agents.

A. KLIPSTEIN & CO., 122 Pearl St., NEW YORK.

IMPROVED MACHINERY

FOR

Bleaching, Dyeing, Drying,

AND

Finishing

TEXTILE FABRICS, ALSO SPECIAL MACHINERY.

The Phœnix Iron Works Corp.,

Founders and Machinists,

OFFICE AND WORKS

54-70 Arch Street, Hartford, Conn.

SEVERIN HEUSCH, Aachen, Germany,

Specialist in the Manufacture of

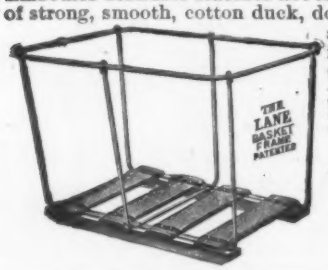
Spirals and Ledger Blades for Shearing Machines

of all kinds. The oldest Cloth Shearing Knife Mfr. in Germany.
American Agents Wanted.

THE LANE PATENT STEEL FRAME CANVAS

MILL BASKET

Embodies desirable features not found in any other basket. It is made of strong, smooth, cotton duck, doubled at all points of extra wear or strain. The Frame is made of specially drawn round spring steel, put together with our semi-flexible eye joints, making it strong and sufficiently rigid, yet springy and resilient, and will stand the most severe use.



W. T LANE & BRO.,
MANUFACTURERS
Formerly of Port Chester, N. Y.

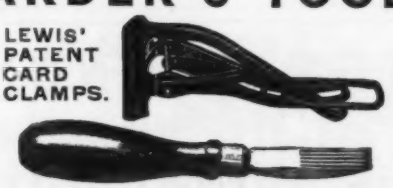
FIG. 20.

POUGHKEEPSIE, N. Y.

DIXON'S
SOLID CRAYONS
leave no marks after bleaching. Contain no aniline dyes. Are made in ELEVEN colors.
Circular 120-J and Samples Free.
Joseph Dixon Crucible Co., Jersey City, N. J.

CARDER'S TOOLS

LEWIS' PATENT CARD CLAMPS.

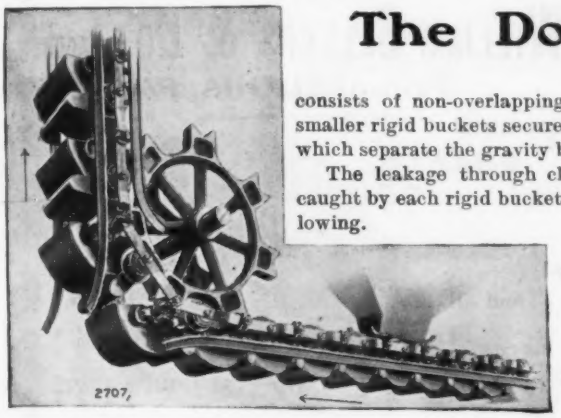


Gardner & Reid's Card Tooth Raiser.
For Setting Up Bent Teeth of Card Clothing with a variety of all other tools used by Carders and Manufacturers.
Send for circular.

W. H. BROWN, No. 81 Mechanic Street, WORCESTER, MASS.

DOBBINS' ELECTRIC SOAP, ABSOLUTELY PURE AND UNIFORM.
Dobbins' Hard Water Soap, a Specific for Hard Water or Water Charged with Chemicals.
AMMONIATED POTASH SALTS FOR SCOURING.
Dobbins' Palm Oil Fulling Soap. Dobbins' "Fast Black" Soap. Pure Olive Oil Potash Soaps.
FREE SAMPLE SENT FOR TRIAL ON REQUEST.
DOBBINS SOAP MANUFACTURING CO., 119 SOUTH FOURTH STREET, PHILADELPHIA, PENN.

TEXTILE MANUFACTURERS
Are invited to ask about our new brand of
Undoubtedly Standard **U. S. ROOFING** **Uuquestionable Superiority**
Made of fine wool felt, chemically treated, coated on both sides, waterproof and durable, guaranteed.
The LINCOLN WATERPROOF CLOTH CO.,
Correspondence Solicited. **Bound Brook, N. J.**



The Dodge Conveyor

(PATENTED)

consists of non-overlapping gravity buckets pivoted between chains, and smaller rigid buckets secured to the chains and extending beneath the gaps which separate the gravity buckets.

The leakage through clearance spaces between the pivoted buckets is caught by each rigid bucket and delivered into the gravity bucket next following.

The Dodge Conveyor is cleanly in operation, simple, safe, practical and durable.

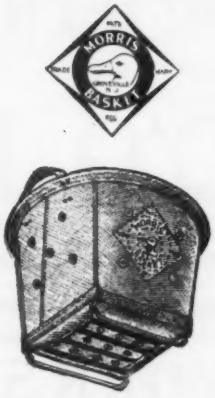
The Link-Belt Engineering Co.,
PHILADELPHIA.
New York, 49 Dey St. Pittsburgh, Park Building.
Chicago, The Link Belt Mchy Co.

TO USERS OF AUXILIARY POWER.

THE HUMPHREY AUTOMATIC CLUTCH IS WHAT YOU NEED.

We also Manufacture Turbine Water Wheels, Rotary Fire Pumps, and a full line of Mill Supplies. Correspondence Solicited.

HUMPHREY MACHINE COMPANY, KEENE, NEW HAMPSHIRE.



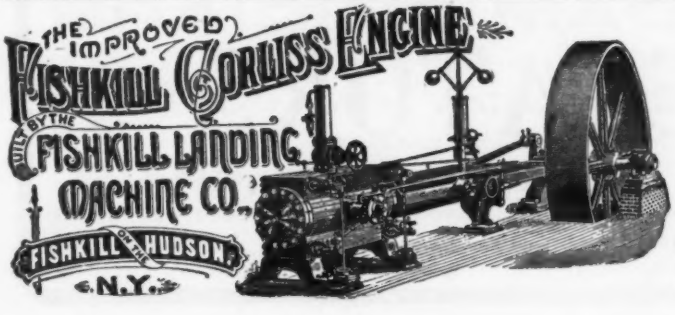
Morris Duck Steaming Baskets

Are made round, square or oblong, and any size to fit steam box.

Brass eyelets are used throughout and we will put in any quantity you desire, and will arrange them to suit you.

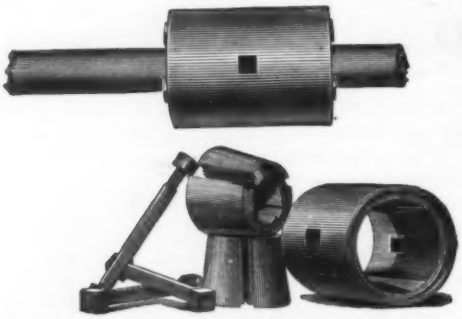
Write for prices.

MORRIS & CO., Groveville, N. J.



Most Efficient and Economical Power in the world For Textile Mills.

It has NO EQUAL for Close Regulation and Noiseless Operation. Send for Catalogue.



THE "SELLERS" MAKE OF

DOUBLE CONE VISE COUPLING

has a way of holding shafts together, that no other COUPLING can equal.

WILLIAM SELLERS & CO., INCORPD.

PHILADELPHIA, PA.

Makers of

SHAFTS,
COUPLINGS,
PULLEYS,
HANGERS,

and all most approved appliances for the

Transmission of Power.

SEND FOR CATALOGUE AND PRICE LIST.

MACHINE TOOLS.
INJECTORS. POWER CRANES.

Singeing Machines

FOR ALL KINDS AND WIDTHS OF GOODS.

CHAS. H. KNAPP,

Wait and Rye Streets, PATERSON, N. J.

CORRESPONDENCE SOLICITED.

SALEM ELEVATOR WORKS

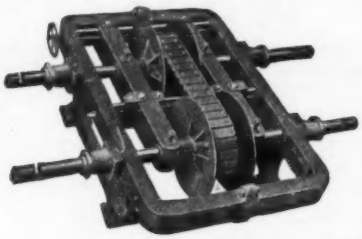
SALEM, MASS.

ELEVATORS

ESPECIALLY ADAPTED FOR MILL USE.

SEND FOR ILLUSTRATED CATALOGUE AND ESTIMATE.

THE EVER VARYING CONDITIONS which must be contended with in textile mills demand a change of speed on many machines and make it desirable on nearly all.



"The REEVES"
Variable Speed Transmission

gives any speed from fast to slow with the most delicate in-between graduations.

Write to-day for catalog. Let us tell you exactly what the transmission will do for you and what it will cost. Let us send you a blue print showing how it may be best installed.

REEVES PULLEY CO., Columbus, Ind.

When in need of pulleys get catalogue of celebrated "THE REEVES" WOOD SPLIT PULLEYS.

A. G. THURSTON & SON,
MANUFACTURERS OF
Fluted Rolls, Pressers for Flyers
AND GENERAL MACHINERY

Specialties made of Renecking, Refluting, Filing and Honing of all kinds of Rolls. Flyers Repaired and Fitted with any desired style of Pressers, Spindles Straightened Restepped and Retopped.

Box 528. FALL RIVER, MASS

Established 1844.

BENJ. BUCKLEY'S SON,
(WM. J. BUCKLEY) **Gun Mill, Patterson, N. J.**
Manufacturer of all kinds of SPINDLES, FLYERS, RINGS, TUBES, CAPS, etc., for Cotton, Silk, Flax, Woolen and Worsted Machinery.
Roving Spindles and Flyers a Specialty. Light Forgings.
REPAIRING OF ALL KINDS.

KILBURN, LINCOLN & CO.,
FALL RIVER, MASS.
MAKERS OF
LOOMS
For PLAIN and FANCY WEAVING.
Represented in the South by
O. A. ROBBINS, . . . CHARLOTTE, N. C.

Gilbert Wood Split Pulleys

SAGINAW MANUFACTURING COMPANY,
SAGINAW, MICH., U.S.A.
New York Branch, 44 Dey St.,
Chicago Branch, 35 So. Canal St.
Sales Agencies in all the Principal Cities.
Cable Address: Engrave. A B C and Lieber's Codes.

NEW ENGLAND BUTT COMPANY,
304 PEARL ST., PROVIDENCE, R. I.
BRAIDING MACHINERY
ALL STYLES AND KINDS FOR FLAT AND ROUND BRAIDS.
SOLID SASH AND CURTAIN CORDS,
SHOE AND CORSET LACES, BANDING
AND ALL BRAIDED FABRICS.

"BRETON" OIL

For Wool,

is of definite and uniform quality. Twenty-five years of hard work, and constant attention to details has brought "Breton Oil for Wool," to its present position of excellence and superiority.

"Breton" requires in its manufacture, careful laboratory manipulation, and test of the fitness of ingredients, and unusual length of time in its proper compounding.

BORNE, SCRYMSER COMPANY,
135 Front St., New York.

Boston, 36 Central Wharf. Fall River, 160 Third St. Philadelphia, 216 No. Front St.
Works, Claremont, N. J.

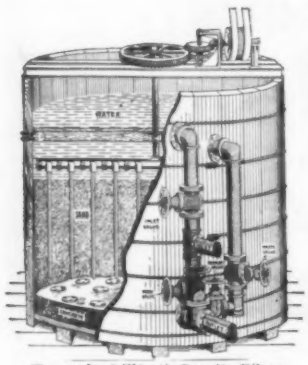
THIS TRADE-MARK

on a rawhide pinion corresponds to the Sterling mark on silver—it denotes the highest degree of perfection. New Process Raw Hide Pinions are the recognized standard of excellence. Owing to patent and secret processes of curing the raw hide, they contain much more of the vital fibre than other raw hide, and **wear like iron.** They provide a **noiseless positive drive**—no noise, no loss of power. Get our free booklet for the facts.

We also make accurately cut and planed Metal Gears, in Spurs, Bevels, Internals and Racks.

The New Process Raw Hide Co., SYRACUSE, N. Y.

MORRIS & WALES, PHILA.



Hungerford-Elfreth Gravity Filter.

HUNGERFORD-ELFRETH

FILTERS PRESSURE and GRAVITY

WATER SOFTENERS INTERMITTENT and CONTINUOUS

There is only one Filter, the

HUNGERFORD - ELFRETH,

the only filter which exceeds its guarantee.

MANUFACTURED BY

Philadelphia Water Purification Company,
1700 N. 12th St., PHILA., PA.

Don't Look Backward

Keep an eye on

15 Whitehall St., New York,

where

The Atlas

Copper Stamp Works

turn out stamps and designs for brown and bleached goods that have earned a reputation of being the real thing at the right price.

Alike in Sunshine or Shadow

In the every-day easy work of any decent belt, or in the meanest stived-up corner in the heat, constant water slopping and splashing of the Bleachery or Dye Works,

LEVIATHAN BELTING

is winning big money for its users, and a fair profit, along with a lot of praise, for its makers. Let us tell you how some of the shrewdest men of the Country learned its persistent money saving powers. A "boiled-down" booklet is yours for the asking.

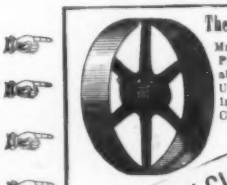
MAIN BELTING COMPANY
Sole Manufacturers
12th AND CARPENTER STS., PHILADELPHIA
55-57 Market St., CHICAGO 120 Pearl St., BOSTON 40 Pearl St. BUFFALO 309 Broadway, NEW YORK

Oils
E. W. Murphey & Co.
HUDSON, N. Y.
Established 1831.

Sewing Machine Belting, Press Boards, Belt Hooks, Lace Leather, Leather Belting, Latch Needles, Oilers of every description, Mill Baskets and Brooms, Mill Banding, Rings and Springs, Packings of all kinds, Fire Pails, Shears and Trimmers, Cloth Knives, Etc.

and Mill Supplies

STEEL HEDDLE MFG. CO.,
1842-46 GERMANTOWN AVE., PHILADELPHIA, PA.
MANUFACTURERS OF
FLAT STEEL HEDDLES
For Silk, Cotton and Worsted Weaving.



The Cambria Shafting & Machine Works,
Manufacture as a Specialty Klein's Patent Friction Pulleys, Adjustable Self-Oiling Bearings, Universal Belt Carriers, Improved Clamp Couplings.

FRICTION CLUTCHES A SPECIALTY

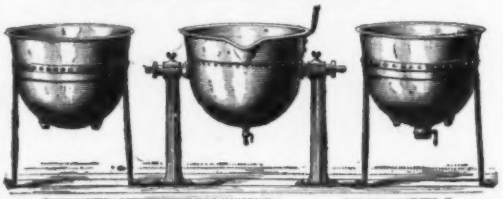
Plans made and estimates furnished for fitting out factories complete with everything required for the transmission of power.
CHAS. C. KLEIN,
Engineer, Millwright and General Machinist,
Marshall St. below Cambria. PHILADELPHIA, PA.

WATCHMAN'S CLOCK, LATEST IMPROVED
Portable and Electric.
Controls Night Watchman.
Allowance made for old clocks.
T. NANZ & CO.,
127 Duane St., N. Y.

CYPRESS WATER TANKS
Best in the World. Send for Catalogue.
Write for delivered prices. H. F. LEWIS & CO., Ltd.
316 Baronne St., New Orleans, La.

WILLIAM SCHOFIELD CO.
Krams Ave., formerly Church St., Manayunk, Phila., Pa.
IRON FOUNDERS
AND TEXTILE MACHINERY BUILDERS
Makers of Rag, Wool, Hair and Finishing Pickers, Automatic Square and Cone Willows, "Schofield" Intermediate Feed for Cards, Rag and Extract Dusters, Waste Pullers, Worsted and Shoddy Reels, All Kinds of Spike and Slat Aprons.
Special Machinery Built General Machinery Repairs
Relagging Picker Cylinders a Specialty

Established 1836.
THOMAS BURKHARD,
494-496 FLUSHING AVE., BROOKLYN, N. Y.



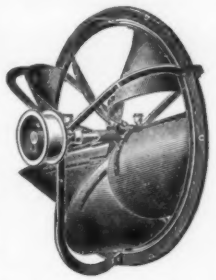
Manufacturer of all kinds of COPPER WORK for DYE HOUSES and PHARMACUETICAL APPARATUS.
Send for Illustrated Catalogue.

Loose Steam.

It is time to think how the loose steam in the dye house is to be removed during the cold weather that is coming.

The Berry Wheel does it most effectually.
It is also unsurpassed for use in drying.

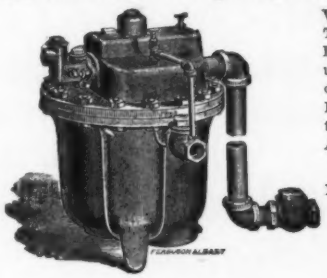
This is our Berry Wheel, the most effective agent for moving air, eliminating steam and other impurities in the atmosphere.



A. HUN BERRY,
23 West First Street,
BOSTON.

STEAM TRAPS

NEW FEATURES: Wearing Parts, Valve and Seat Renewable.



We manufacture Steam Traps for all duties, High and Low Pressures, returning the Condensation back into Boiler or Discharging to Hot Well, Tank, or Atmosphere.

No Elastic Gaskets, all Joints Ground Metal and Metal.

Class A Return Trap

SEND FOR
Catalogues A, B and C

ALBANY STEAM TRAP CO.
ALBANY, N. Y.
Established 1870.
FRED'K TOWNSEND, Pres. JAMES H. BLESSING, Gen. Mgr.

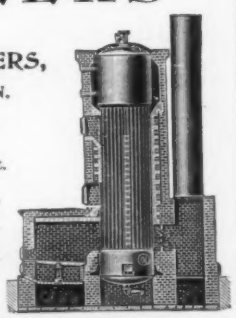
WICKES

Vertical Water Tube

BOILERS

Built by
WICKES BROTHERS,
SAGINAW, MICHIGAN.

Branch Offices at
New York 95-97 Liberty Street.
Pittsburg 45th and A. V. R'y.
Chicago 1214 Marquette Blds.
Boston 922 Board of Trade Bldg.
Denver, Colo.
Birmingham, Ala.
Send for Catalogue.



Elliot Cloth Folder and Measurer

FOR COTTON, AND GINGHAM MILLS, BLEACHERIES, PRINT WORKS, ETC.

MANUFACTURED BY
ELLIOT & HALL, 54½ Hermon St., Worcester, Mass
Send for Circular.

Standard of Excellence

STEPHENSON BEST BAR BELT DRESSING BEST
PRESERVES BELTS — PREVENTS SLIPPING

Sole by progressive dealers or by
STEPHENSON MFG. CO.
ALBANY, N. Y.

SILK MILL SUPPLIES

OF EVERY KIND AND DESCRIPTION
Also Power Transmission Supplies for General Mill Use.

I. A. HALL & CO.
Paterson, N. J.

Allentown Reed, Harness and Mill Supply Co.,
Allentown, Pa.

American Textile Spe=

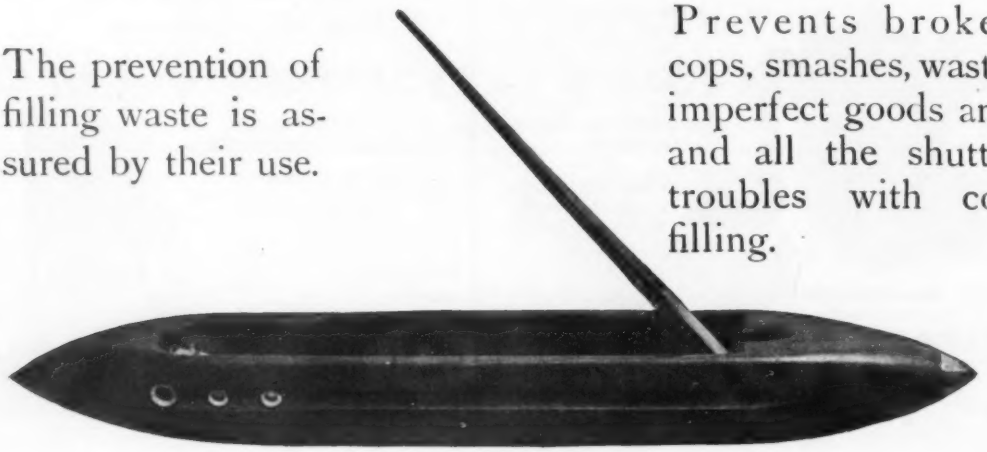
363=373 Rider Avenue

(Near 138th St. Station N. Y. C. RR.)

Never Slip Cop Spindles

The prevention of filling waste is assured by their use.

Prevents broken cops, smashes, waste, imperfect goods and and all the shuttle troubles with cop filling.



U. S. Patent Nos. 778,851 and 790,611.

Already demonstrated by practical tests by a number of representative mills.

Send for prices, particulars and testimonials.

cialty Machinery Co.

New York City, N. Y.

Never Slip Cop Tubes

Valuable improvements embodied in our new "Never Slip Cop Tubes" if used in combination with our Expanding Cop Spindles guaranteed.

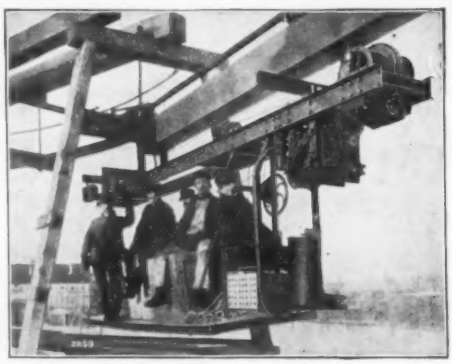
Longer life to the tubes.
More marketable looking cops.
Easier handling by the operatives.
Better finished product.
Saving in labor costs
And in waste and shrinkage.

Patent applied for.

Particularly adapted to long cops and gratifying results obtained. On a test of 200 looms in one of the largest mills in the country

A saving of an average of $100.00 per day was made.

TELPHERAGE



Electric Hoist, 3000 lbs. capacity, 60 feet per minute. Travels at 600 feet per minute. Installed for the Sayles Bleacheries, Saylesville, R. I.

has special adaptability to the textile industry, and brings economy with it. The handling of materials and goods is quickly accomplished—transferred from dye house to shipping room, railroad or wharf—regardless of difficulties that seem insurmountable. Telpherage conveys over streets, driveways, railroad tracks, rivers, valleys—on straight lines or curves—on any degree of incline.

We Invite Questions.

United Telpherage Department

THE DODGE COAL STORAGE COMPANY

Philadelphia—Nicetown.
New York—49 Dey St.
Chicago—39th St. and Stewart Ave.
Pittsburgh—1501-2 Park Bldg.
Boston—164 Federal St.
Portland, Ore.—309 McKay Bldg.

The Best Lubricating and Softening Product

FOR WOOL, COTTON, WOOL AND COTTON MIXED

—— IS THE ——

EXCELSIOR WOOL OIL COMPOUND

Absolutely free from Mineral Oils, Saponifies Perfectly, Odorless, Pure White and Stainless. Washes out Perfectly and Easily. Great Economy Guaranteed in its Use. Write for samples, prices and full particulars

The EXCELSIOR WOOL OIL COMPOUND CO. - - - - CINCINNATI, OHIO.

THE L. M. BOWES COMPANY,

Every Description of Fine Leather for Textile Use.

SOLE AGENTS IN THE UNITED STATES FOR

CHARLES CAIN, SON & GREENWOOD,

HALIFAX, ENGLAND.

MAKERS OF HIGH GRADE

CARD CLOTHING

For Cotton, Woolen, Worsted and Silk.

451 ATLANTIC AVENUE, - - - - BOSTON, MASS.

MASON

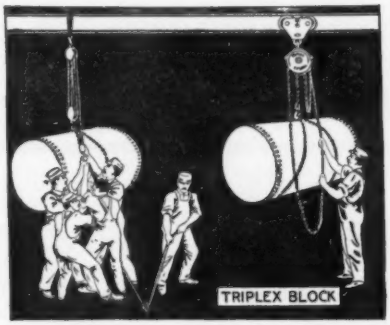
REGULATOR

CO.

BOSTON, MASS., U. S. A.

Reducing Valves
Pump Pressure Regulators
Pump Governors
Belt Shifters
Rheostat Regulators
Automobile Engines
Balanced Valves
Damper Regulators

and other devices for regulating pressures of steam, air and water.
Write for our Catalogue.



SAVE THAT HARD WORK

Life's too short and too valuable to tug and pull at an inferior hoist wasting the time of four or five men and wearing them all out and possibly injuring some one when

A Triplex Block

will do the work with one man pulling easily.

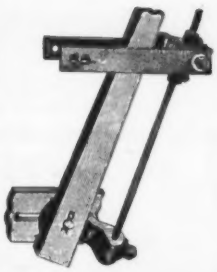
Now there's a dollar reason, too—you'll find the saving amounts to a very considerable sum in the course of a year.

Cut down lifting costs with a Yale & Towne TRIPLEX, which is to be had *on trial* from almost any machinery dealer.

Ask us for catalog containing hoisting data of practical use to all mill men.

YALE & TOWNE MFG. CO.
9-15 Murray St., New York.

New Lug Strap



No boring of holes in Picking Stick. Positively will not burn out. No lost power, no stretching. Easily adjusted, saves time and smashes.

W. H. Kelley & Co.
1850 Perkiomen Ave.
READING, - - PA.

Honest Rating

HAS HELPED TO BUILD UP THE ENVIABLE REPUTATION OF OUR MOTORS AND GENERATORS

Our Form I Motor, built for 3 to 90 H. P.

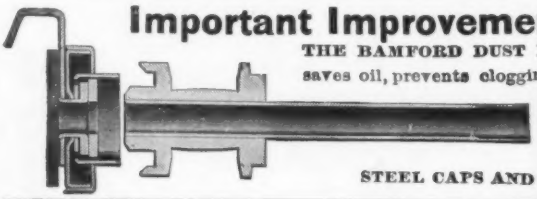
WE offer you Expert Advice on Electric Drive in Textile Mills.

Crocker-Wheeler Company,
Ampere, N. J.

BRANCH OFFICES IN 16 LEADING CITIES.

Kaumagraph Trade Mark Stamps give a clear impression on any class of fabric from most delicate silk to heaviest blankets.

KAUMAGRAPH CO., 156 Fifth Ave., New York.



Important Improvement in Worsted Spinning.

THE BAMFORD DUST PROOF and SELF-LUBRICATING SPINDLE TUBE

saves oil, prevents clogging with dust and lint, thereby insuring longer life to the tubes, saves labor, maintains uniform speed, and most important of all, makes PERFECT YARN. Refer to largest worsted mills.

BAMFORD & SMITH, Pascoag, R. I.

ALSO MFRS. OF

STEEL CAPS AND SPINDLES. **Caps, Flyers, Tubes, etc., Repaired.**

TRIPLEX

STRENGTH DURABILITY EFFICIENCY OMNE TRINUM PERFECTUM

A NEW CATALOGUE

OF

GOULDS POWER

PUMPS

For EVERY SERVICE

Containing valuable information about PUMPING is yours for the asking.

THE GOULDS MFG. CO.,

Works and Main Offices: **SENECA FALLS, NEW YORK.**

16 Murray Street, NEW YORK. 8 Oliver Street, BOSTON.
22 No. Canal Street, CHICAGO. 318 Bessemer Bldg., PITTSBURG.

SCHUTTE & KOERTING CO.

Engineers and Machinists, 12th and Thompsons Sts., Phila., Pa.

Spray Nozzle emitting water in a fine spray or vapor.

Complete Humidifying Plants

For Woolen Mills, Cotton Mills, Spinning Mills, Silk Mills, etc.

We also manufacture Injectors, Blowers, Condensers, Syphons, High Class Valves, Sulphur Furnaces for Bleaching Purposes.

CORRESPONDENCE SOLICITED.

A Cell Dryer Investment!

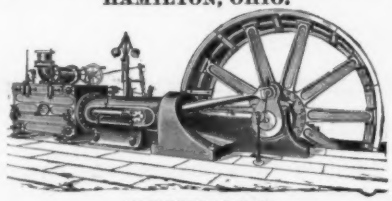
We are now building for a prominent bleachery a large Cell Dryer to be used for a part of a continuous process. This machine will cost about $3,000, and will save the labor of three men. At $1.75 a day each, this means about $1,575 saving per year, which is just **52½ per cent. on the original investment.** The Cell Dryer alone makes this saving possible. It is the only dryer which is compact enough to go into the available space, and the only one which could be looked after by the attendant required for the first part of the process. Write to 15 State Street, Boston, for latest list of users and other information.

VACUUM PROCESS COMPANY

DYEING MACHINES
JOHN W. FRIES
WINSTON-SALEM, N.C.

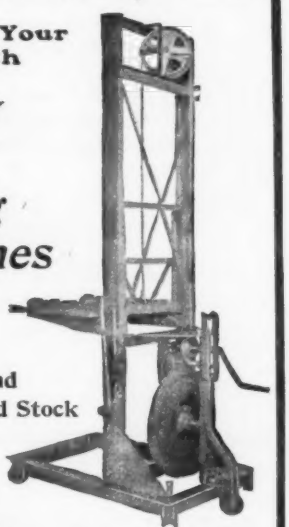
ARE YOU IN NEED OF CUTS
IF SO, NOTIFY—
Smith Bros.
WOOD, ZINC & HALF-TONE ENGRAVING.
KNITTING MACHINERY & ALL KIND OF MECHANICAL WORK OUR SPECIALITY.
119 S. 4th Street
PHILADELPHIA, PA.

The Hooven, Owens & Rentschler Co.
HAMILTON, OHIO.



BUILDERS OF THE
Hamilton-Corliss Engine.
Simple, Compound and Condensing, of any size, for all purposes.
New York Office, 39 and 41 Cortlandt St.
Chicago Office, 46 South Canal St.
St. Louis Office, 317 Security Building.

INCREASE YOUR STOCK SPACE 1/3
By Handling Your Cases With
Economy Steel Tiering Machines



Also Saves
TIME,
LABOR and
Damaged Stock

Write for Descriptive Pamphlet Today.

Economy Engineering Company,
58-64 N. Jefferson Street,
CHICAGO, ILL.

General Electric Company

Electric Power Equipments

for Textile Mills

Curtis Steam Turbine Generators in the power house and General Electric induction motors in the mill constitute the ideal power equipment for the modern textile mill.

The high economy, rugged construction and perfect mechanical operation of the Curtis Steam Turbine Generator has resulted in its rapid adoption for power stations furnishing electricity to hundreds of thousands of horse-power of electric motors.

Made in sizes from 15 to 8000 Kilowatts' capacity.

Now in use or on order for use in 40 States of the Union and in 14 foreign countries.

Textile mills are now using or have ordered 100,000 horse-power of General Electric induction motors.

The advantages of electric drive for textile mills are:

1. Saving in cost of belting, shafting, building, and investment for future extension.
2. Increased production and few "seconds" due to absolute uniformity of speed.
3. Subdivision of power—independent operation of each department.

The General Electric Company employs specialists trained in textile work whose services are at the disposal of engineers or manufacturers for consultation or advice.

Principal Offices: SCHENECTADY, N. Y.

Mill Power Office, 84 State Street, Boston. Southern Office, Empire Bldg., Atlanta.
New York Office, 44 Broad Street.

712

Jones & Laughlin Steel Company

AMERICAN IRON & STEEL WORKS

Pittsburgh, Penn.

WE MANUFACTURE AND ERECT COMPLETE

Power Transmission Equipments

including Cold-Rolled Shafting, Couplings, Bearings, Pulleys, Rope Sheaves, Mule Stands, Belt Tighteners, Binder Frames, Guide Pulleys, Friction Clutch Couplings and Pulleys, Steel Structural Material for Rope or Belt Towers with Ladders and Galleries.

We would be pleased to receive your inquiries for estimates.
Write for our Catalogue and Discounts.

Manufacturers of Bessemer and Open Hearth Steel, Blooms, Billets and Slabs. Steel Beams, Channels, Plates, Angles, Tees, Zees and Columns. Round, Square and Flat Bars of all sizes. Tee Rails and Fastenings.

Special attention given to Steel Structural Work, fitted ready for erection, and suitable for fire-proof floors in Cotton Mills, Power Houses, etc.

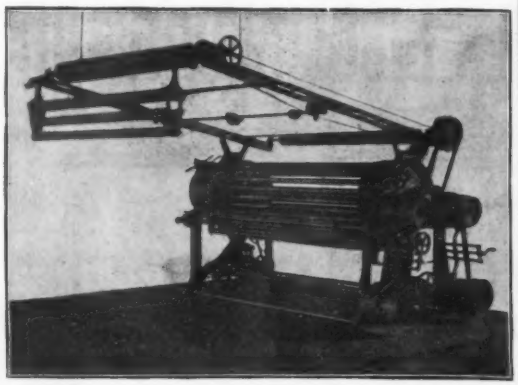
Railroad, Boat and Barge Spikes, Structural and Boiler Rivets. All Grades of Coil Chain and Forgings of all kinds. Cold-Rolled Steel Shafting, Pump and Piston Rods, Squares, Hexagons, Flats and Miscellaneous Shapes. Also Cold-Rolled Axles for Electric Street Railway use, and Special Screw Steel for Automatic Machines.

BRANCH HOUSE AND WAREHOUSE

CHICAGO, ILL.

Branch Offices

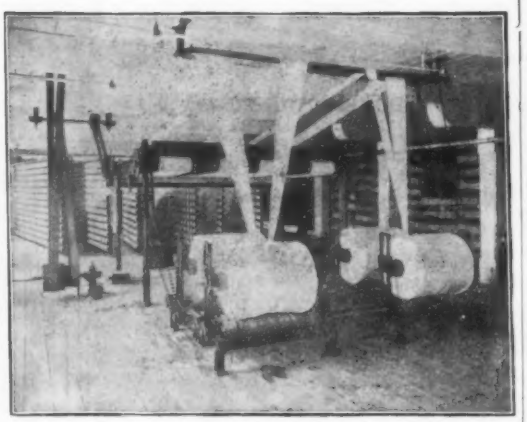
New York Boston Philadelphia Buffalo Cincinnati Cleveland
Detroit St. Louis Atlanta San Francisco New Orleans



Double Acting Napping Machine

which if used in connection with our FELTING MACHINE, will give the goods a smooth felt-like finish and a very thick feel.

Nappers Built for all Kinds of Goods.



THE ABOVE IS A

Four Ball Warping Machine

WITH ELECTRICAL STOP MOTION

each wire making two contacts when the thread breaks. Built in all sizes.

For further particulars address

RICHARD C. BORCHERS & CO.,
Frankford, Philadelphia, Pa.

DINSMORE

Mill Sewing Machines

No. 9—Portable Foot-Power Rotary Sewing Machine.

It is especially adapted for use in Cotton and Woollen Mills, Bleacheries, Print Works at the Printing Machines, in Dye Works, Cloth Rooms, at the Fulling Mill, Shears, Calendars, Gigs, Drying Machines, etc., or any of the different finishing processes in textile mills.

Manufactured by the

DINSMORE MANUFACTURING CO.,
Salem, Mass., U. S. A.

North Chelmsford Machine & Supply Co.

Successors to Silver & Gay Co., Est. 1832.
Successors to No. Chelmsford Supply Co., 1897.

MANUFACTURER OF

Ball Winders, Quillers, Jack Spoolers, Wool Openers, Reels and Special Machines from Drawings or Patterns.

WORSTED MILL SUPPLIES.

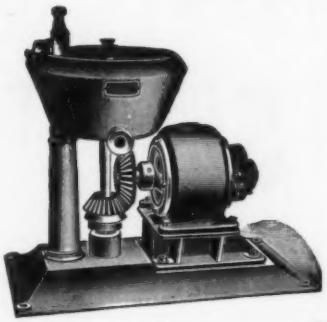
Leather Belting, Worsted Aprons, Fallers, Brushes and Comb Circles. Repairing, Covering, Turning, Bossing and Refluting, Drawing and Spinning Rollers a Specialty.

NORTH CHELMSFORD, MASS.

ELECTRICALLY DRIVEN

CENTRIFUGAL

Oil Separator



MOTOR WOUND FOR ANY VOLTAGE.

Separates oil from bolts, nuts, and scraps of all kind—oil that would otherwise be wasted, and makes it as good as it ever was, for further use. **Send for Catalogue.**

MANUFACTURED BY THE

American Tool & Machine Co.,

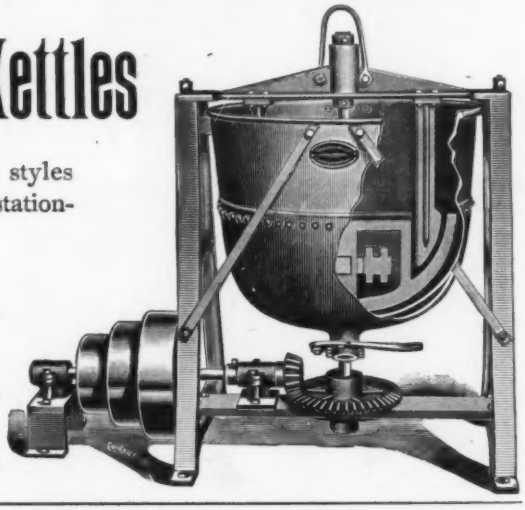
109 Beach Street, Boston, Mass.

Incorporated 1864. Founded 1845.

Established 1841.

Steam Jacket Mixing Kettles

This cut represents one of our many styles of steam mixing kettles, made with stationary and removable stirrers.



E. B. BADGER & SONS CO.,

COPPERSMITHS,

66 Pitts St., - BOSTON, MASS.

Badger Fire Extinguisher.

Established 1849. Mass. Corp. S. R. MASON, Treas. and Mgr.

MASON BRUSH WORKS,

Manufacturers and Repairers of

CARD ROLL.

Mill and Machine Brushes

For Textile, Paper Mills, Etc.

Write for Catalogue. WORCESTER, MASS.

A. J. WEEKS,

926 E. Market Street, Akron, Ohio.

MANUFACTURER OF

Chemical Stoneware, Jars, Jugs, etc,

For Mills, Dyers, Bleachers, etc., from 10 to 200 Gallons capacity.

Write for Illustrated Circulars and Prices.

Eureka Fire Hose

THE BEST FIRE HOSE MADE.

(Trade Mark.)

For use in

Cotton Mills, Woolen Mills and Factories.

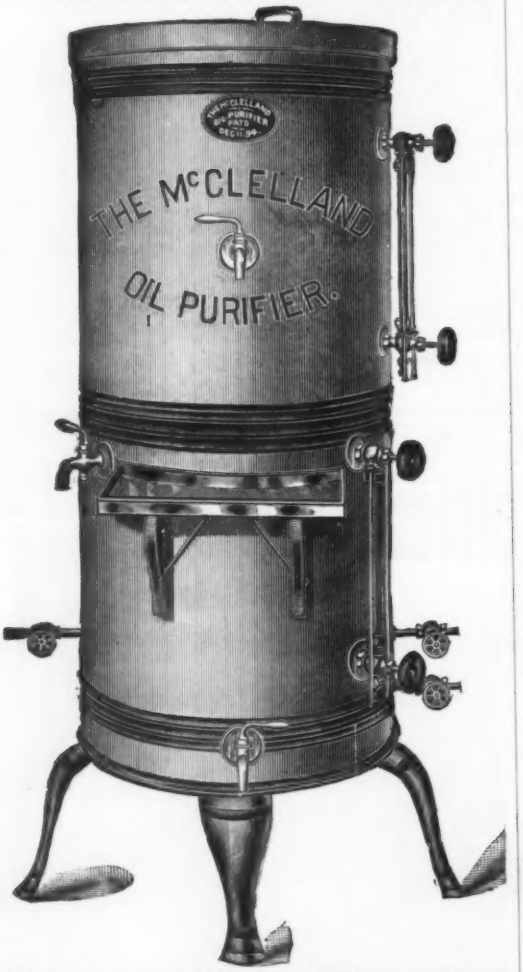
Seamless Woven and Rubber lined EUREKA COTTON HOSE, has no equal. Send for circular and testimonials.

Awarded Gold Medal at the St. Louis Exposition, 1904.

EUREKA FIRE HOSE CO.,

13 BARCLAY STREET, NEW YORK, N. Y.

The McClellan Oil Purifier



Lessen Your Repairs
by using pure oil.

Decrease Your Oil Bill
by using this device.

IT PURIFIES—NOT FILTERS.
SOLD ON TRIAL. WRITE FOR BOOKLET.

One of many testimonials:

Gentlemen:—The Oil Purifier which you furnished the Centre Market in this City about four years ago has done all you claimed for it and has effected a saving of at least 50 per cent. in our oil bills. The machine has fully paid for itself, and I cheerfully recommend it to all users of oils on Engines. Very respectfully,
H. BOESCH,
Sec'y Board of Examiners of Steam Engineers, Washington, D. C.

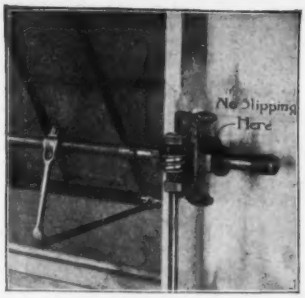
PATTERSON, GOTTFRIED & HUNTER, Limited,
Machinery, Metals, Hardware, Tools and Supplies,
146-150 Centre Street, - NEW YORK CITY.

SPINDLES

EASTON AND BURNHAM MACHINE CO.

PAWTUCKET, R. I.

REPAIRS FOR RABBETH SPINDLES



NO SLIPPING HERE

Mighty important too, for the entire turning strain of sash operating devices comes right there! Perfectly simple, but it does the work—the way with every other part. No link breaking chains—no slipping cables—no short lived springs—but just fifty years of knowing how, put into our devices. Catalog B-V. covers factories, mills, offices, stores, buildings, etc.

Burnham, Hitchings, Pierson Co.
St. James Bldg., New York.

SIMPSON BROS. CORPORATION

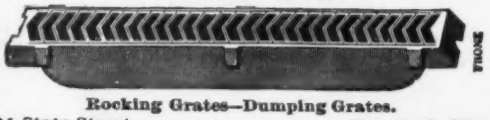
166 DEVONSHIRE STREET (Room 58) BOSTON, MASS.

Contractors for Concrete Work for Textile Mill Buildings, Dye Houses, Bleacheries, Tanks, Etc.

REINFORCED CONCRETE CONSTRUCTION

W. W. TUPPER & CO., GRATE BARS

For Any Kind of Fuel.



Rocking Grates—Dumping Grates.
24 State Street, - - - - - New York City.

Duxbury's English Calender Roll Papers

FOR EMBOSSING AND OTHER CALENDERS.

CHAS. A. JOHNSON & CO. Sole Agents for America
55-57 Franklin St., NEW YORK.

Soft Clear Water.

We-Fu-Go and Scaife Water Softening Plants, and Scaife Water Filters can be seen in actual operation in Textile Plants in any part of the U. S. Apparatus designed to suit each special case, and we guarantee results. Write for Illustrated Catalogue.

WM. B. SCAIFE & SONS CO., Pittsburgh, Pa.

Rigid
Light
Unbreakable
Handy
Low List
High Discount

"American Pioneer" Pressed Steel Shaft Hangers

are especially adapted for use in
TEXTILE MILLS
because the frames will not absorb oil, consequently lint will not stick to them

MANUFACTURED BY
Standard Pressed Steel Co.
Philadelphia, Pa.
For sale by supply houses throughout the U. S. and Canada.

Rock Bottom Rates to Pacific Coast

$33 from Chicago, $30 from St. Louis, $25 from Missouri River points. One-way tickets on sale daily, September 15 to October 31, 1905. Corresponding reduction from other points, and from the East generally. Los Angeles, San Francisco, Portland, Seattle—choose your route. Stop-overs of five days anywhere west of certain points in Arizona, Nevada or North Dakota, and in California, except at Los Angeles and San Francisco.

You can go through New Mexico or through Colorado. The Rock Island runs improved Tourist Sleepers via both routes.
Via El Paso Short Line, the Rock Island maintains a quicker tourist service to California than any other road or route.

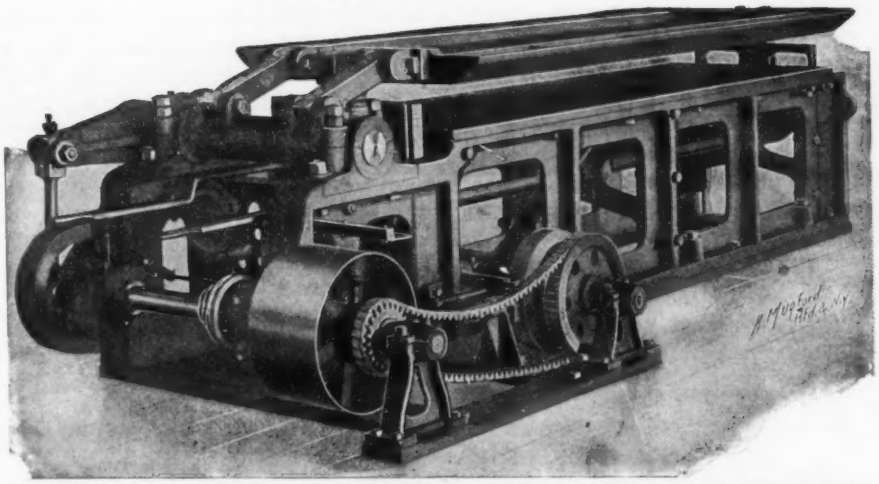
Rock Island System

Write today and we will send you our illustrated Tourist Folder, giving details of Rock Island through service, with map and full information.

C. B. SLOAT, New England Pass. Agt.
288 Washington St., Boston, Mass.

Farrel Foundry & Machine Co.

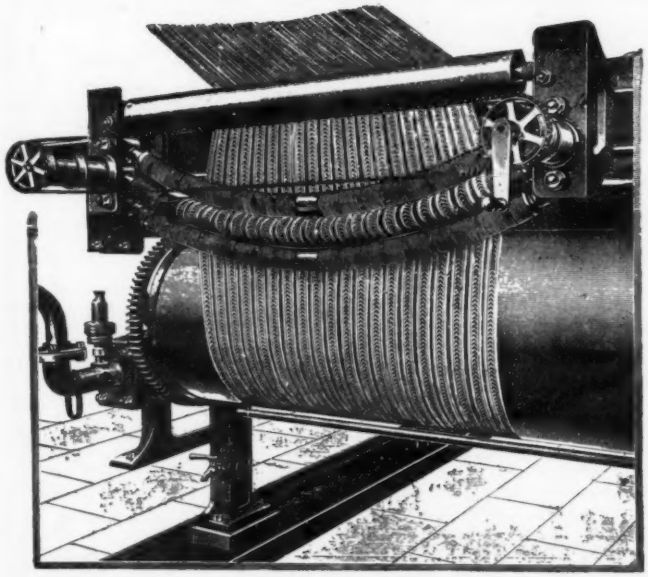
ANSONIA, CONN.



SINGLE AND DOUBLE FELT HARDENERS.

Chilled and Soft Iron Rolls, Machine Moulded and Machine Cut Gearing, to 20 ft. diameter. Heavy Transmission Machinery, Etc., Etc.
Heavy Castings, in Gray Iron or Semi Steel.

A PERFECT CLOTH EXPANDER



The recent invention of Wm. Mycock, an English cotton manufacturer. Hundreds sold in Great Britian and on the Continent. Large bleacheries in this country where it has been placed on trial are delighted with it. Gets the full width of goods, with perfectly even tension both ways. Can be attached to calenders or cans. Put it on trial.

Patented in United States, Canada, Great Britain and Continental countries. Infringements will be prosecuted.

THOMAS LEYLAND & CO., 53 INDIA ST., BOSTON.

Sole Agents for the United States and Canada.

USEFUL BOOKS

THE following list contains the titles of some of the textile books for which there is the greatest demand. We carry these in stock for prompt delivery. Our full descriptive catalogue, giving lists of all textile books published in the English language, with a brief synopsis of contents, will be mailed free upon application.

General Subjects—Cotton or Woolen.

Manual of Weave Construction, by *Ivo Kastanek*, Edited and arranged by S. S. Dale 1.00

Calculations in Yarns and Fabrics. Bradbury..	1.00	Technology of Textile Design. Posselt	5.00
Carpet Manufacture. Fred Bradbury. Just published	3.00	Textile Calculations. Posselt	2.00
Chemical Technology of Textile Fibres. Georgievics	4.50	Textile Fibres of Commerce. Hannon	3.00
Drying by Means of Air and Steam. Hausbrand	3.00	Textile Machinery Relating to Weaving. Posselt. Part 1	3.00
Simplex Comparative Yarn Tables, Reed Tables, Weight Tables and Other Useful Tables	.50	Part 2	3.00
Spinning and Twisting of Long Vegetable Fibres. Carter	5.00	Textile Raw Materials. Zipser	5.00
Technical Testing of Yarns and Fabrics. Herzfeld	3.50	The Jacquard Machine, Analyzed and Explained. Posselt	3.00
		The Textile Fibres. Matthews. Just published	3.50
		Wool, Cotton, Silk from Fibre to Fabric. Posselt	7.50

On Cotton Manufacture.

Carding and Spinning. Ivey. Just published..	1.25	Cotton Spinning (3 vols.). Taggart	7.50
Cost Finding in Cotton Mills. Nichols	1.50	Cotton Weaving. Marsden	3.00
Cotton Carding. Lindsay	.50	Cotton Weaving and Designing. Taylor	2.50
Cotton Combing Machines. Thornley	3.00	Draw Frames and Fly Frames. Thornley	3.00
Cotton Mill Commercial Features. Tompkins..	5.00	Humidity in Cotton Spinning. Dobson	1.50
Cotton Mill Processes and Calculations. Tompkins	5.00	Loom Fixing and Weaving. Ivey	1.25
Cotton Manual. Broadbent	.75	Practical Carder. Greer	1.00
Cotton Manufacture. Lister	3.00	Practical Cotton Calculations. Whitworth	1.00
Cotton Manufacturing. Part 1. Posselt	3.00	Students Cotton Spinning. Nasmith	3.00
Cotton Spinning. Marsden	1.75	The Cotton Fibre and the Mixing of Cotton. Monie. Just published	1.50

On Woolen Manufacture.

Cone Drawing. Buckley	.50	Worsted Overlookers' Hand Book. Buckley ..	.50
Finishing Woolens and Worsteds. Greene	.50	Wool Spinning. Vickerman	1.75
Principles of Wool Combing. Priestman. Just published	1.50	Weaving and Loom Fixing. Nightingale	.50
Spinning Woolen and Worsted. McLaren	1.50	Woolen and Worsted Loom Fixing. Ainley	1.00
Wool Carding. Brown	.50	Woolen and Worsted Manufacture. Beaumont	2.00

Bleaching, Dyeing, Printing, Etc.

Bleaching and Calico Printing. Duer	4.00	Principles of Harmony and Contrast of Colors. Chevreul	1.50
Bleaching of Linen and Cotton Yarns. Tailfer	5.00	Same with Colored Plates	2.25
Chemistry of Dye Stuffs. Georgeivics	4.50	Printing of Textile Fabrics. Rothwell	6.00
Color Matching. Paterson	3.00	Science of Color Mixing. Paterson	3.00
Dyeing of Cotton Fabrics. Beech	3.00	Silk Dyeing, Printing and Finishing. Hurst ...	2.00
Dyeing of Textile Fabrics. Hummel	1.75	Sizing Ingredients. Monie	1.00
Dyeing Wool and Woolen Fabrics. Beech	3.50	Wool Dyeing. Part 1. Gardner	2.00
Finishing of Cotton Goods. Depierre	10.00	Wool Dyeing. Part 2. Recently published. Gardner	5.00
Mercerization. A Practical Manual with 362 Samples. 2 vols.	7.50		
Principles of Dyeing. Fraps	1.60		

Any of the above sent postpaid on receipt of price. Subscribers to Textile World Record may buy books from us upon the understanding that if not satisfactory they may be returned within a few days (postage or express paid by purchaser) if in good order, and money will be refunded.

LORD & NACLE CO., 299 Devonshire Street. **Boston, Mass.**

American

THE AMERICAN MFG. CO.

MANILA - SISAL - JUTE - CORDAGE

65 WALL STREET, .. NEW YORK

Large or Small, the Cordage that comes from our mill doors is perfect in workmanship, and of the highest quality. Everything from a small India Twine to the largest Ship's Hawser.

"AMERICAN" TRANSMISSION ROPE

"The Rope to Remember."

Is the best example of the rope makers art. Self-lubricating . . Stretched in process of manufacture.

"THE BLUE BOOK OF ROPE TRANSMISSION"

Shows how to Save Power, Space and Money. Sent free upon request.

Ropes

KUTTROFF, PICKHARDT & CO.

Sole importers of the products manufactured by

BADISCHE ANILIN- & SODA-FABRIK,

Ludwigshafen o / Rhine, Germany.

Importers of

Coal Tar Dyes

(Alizarine Dye Group
Aniline Dye Group)

Indigo—pure B.A.S.F., Colors, Chemicals

FOR

Calico Printers. Cotton Mills.
Woolen Mills. Paper Mills.
Tanners.

128 DUANE ST. - - - NEW YORK.

Branch Offices:

Boston - - - - - 153 Milk Street.
Providence - - - 80 So. Water Street.
Philadelphia - - 207 Chestnut Street.
Chicago - - - 207 Michigan Street.
San Francisco - - 215 Sacramento Street.

TEXTILE WORLD RECORD.

Published Monthly by

LORD & NAGLE COMPANY,

FRANK L. NAGLE, President. HENRY G. LORD, Treasurer.

MAIN OFFICES:

299 Devonshire St., Cor. Summer St., Boston, Publication and Editorial Offices.

425 Walnut Street, Philadelphia.

BRANCH OFFICES:

123 Liberty St., New York. 115 Dearborn St., Chicago.

Entered at the Boston Post Office as Second-Class Mail Matter.

SAMUEL S. DALE, Editor. E. A. POSSELT, Editor Process Department.

Subscription and Directory Rates.

The **Textile World Record**, including **Annual Official Directory** (Traveler's Edition),	$3.00 per year
The **Textile World Record**, without the Directory,	2.00 per year
The **Directory** alone is $2.00 per copy for the Traveler's Edition; $2.50 for Office Edition.	
The **American Directory of Knitting Trade** is	1.00 per copy
For **Foreign Countries** the **Textile World Record** without Directory (postage paid)	3.00 per year
For **Foreign Countries** the **Textile World Record** with Directory (postage paid)	4.00 per year
The **Dyer's Supplement** is	1.00 per year

Remit by Express Order, Postal Money Order, Cheque or Registered Letter to Boston Office.

Advertising Rates.

WANTS, FOR SALE, ETC. If set solid under Classified advertisements, Special Notices, or Second-hand machinery headings, 15 cents per line, each issue, if replies are to come in care of TEXTILE WORLD RECORD to be forwarded; 10 cents per line if replies are direct to advertiser. Count seven words to the line.

If displayed $2.00 per inch, single column, each issue.
Cash must accompany order for transient ads.

REGULAR ADVERTISEMENTS. Rate cards sent on application.

Date of Publication.

THE TEXTILE WORLD RECORD IS PUBLISHED ON THE 12th OF EACH MONTH.

Copy for regular advertisements must reach publication office by the 25th of month preceding date of issue to insure proper attention. Transient ads., Wants, For Sale, etc., to go on Classified pages, can be taken up to the 4th of the month of publication.

We are always pleased to co-operate with advertisers in preparing attractive advertisements, and strongly recommend frequent change of copy, which increases the interest, and, therefore, the beneficial results of the advertising. We will cheerfully change copy as often as may be desired, providing it reaches us in time, but we cannot promise changes for next issue unless received as above stated.

The Official Directory of the Textile Industries of the United States and Canada,

Is published annually in the spring by LORD & NAGLE CO. It is a book of about 500 pages, well printed and bound. Office Edition $2.50. Traveler's Edition, $2.00.

PART I. Contains a complete directory of all the textile establishments in the United States and Canada. It tells what goods are made, the number of sets of cards, spindles, looms, whether and what they dye or finish, steam or water power, who the selling agents are, the names of the officers, superintendent and buyer.

There are 22 textile maps; gives population of town and railroad connections.

PART II. Is the Yarn Trade Index, containing classified lists of yarn spinners, arranged according to kind of yarn, size and number spun, etc. All the mills with worsted machinery are included in this section.

PART III. Contains classified list of mills doing order and commission work, also dyeing, finishing, bleaching and printing establishments, classified according to the kind of work done, and so far as possible giving width of goods handled; also shoddy, extract and flock manufacturers and wool scouring establishments.

PART IV. Manufacturer's Selling Agents and Dry Goods Commission Merchants, giving the name and address of concern, character of goods handled, different departments, with managers, list of manufacturing clothiers, and suit and cloak manufacturers, giving specialties and buyers names. A list of city offices of textile mills is given.

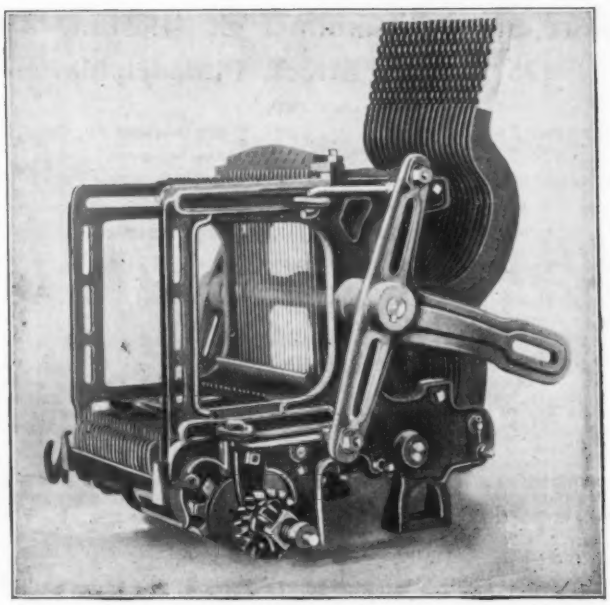
PART V. Dealers and Brokers in raw materials and stock, including wool and shoddy dealers and brokers, cotton dealers and brokers, factors and buyers and wholesale rag dealers making a specialty of textile interests.

PART VI. Buyers Index of Textile Machinery and Supplies, and statistics showing textile machinery in the United States, giving spindles, looms, knitting machines, etc.

The Directory of the Knitting Trade in the United States and Canada

Is published early each year by LORD & NAGLE CO. It is a complete directory of all the establishments in the United States and Canada manufacturing knit goods. It gives the location of the mill, the capital stock, names of the officers, superintendent and buyer, class of goods made, the machinery, including number of knitting machines and sewing machines, selling agents, if any, and in most cases the class of yarn bought. It also contains a list of commission houses making a specialty of knit goods, and jobbers and large retailers having knit goods department, in most cases giving the names of manager in charge of knit goods. The book is small so that it may be carried in the pocket. Price is $1.00.

DOBBIES



CROMPTON & KNOWLES IMPROVED DOBBY

MANUFACTURERS OF DRESS GOODS AND OTHER FANCY FABRICS SHOULD HAVE A COPY OF OUR 1905

CATALOGUE OF DOBBIES

Latest improved types fully illustrated and described.

Crompton & Knowles Loom Works

WORCESTER, MASS.

PROVIDENCE, R. I. PHILADELPHIA, PA.

Table of Contents for October.

PAGE

Monthly Comment 69
Seasonable Fabrics 77
Tussah Silk Waste in Europe 80
Meeting of the New England Cotton Manufacturers' Association 81
Use and Occupancy in Steam Boiler Insurance 114
Flocking Woolen Goods 115
Loom and Finished Weights of Woolen Goods 116

KNITTING DEPARTMENT.

Knit Goods Situation—Production of Knitting Machines—The Bach Knitting Machines—The Production of Circular Spring Needle Knitting Machines—A Knit Goods Dryer—A Stocking Press—Knitting Mill News 117

TEXTILE PROCESSES.

Combing—Houghton's Improved Thread Board—Card Clothing for the Fancy of Woolen Cards—Improvement to Twisting and Spinning Machinery—Improvement to Jacquards—Palma Yarn Reel—Silk Dyeing Apparatus—Face Finished Woolens—Electrical Stop Motion for Warpers—Size for Cotton Yarn—Soundness for Wool Fibres—Moisture Proof Bobbins—Oiling Lifter Rods—Measuring Cloth in the Loom—Fly Protector for Ring Frames—Bitten Yarn Holder 29
The Manufacture of Fancy Yarn 149
Causes of Defects in Fabrics 154
A Cross Stitch Cloth 158
Letters to a Young Woolen Finisher 162
QUESTIONS AND ANSWERS 164
NEW MACHINERY AND PROCESSES 166

DYEING, BLEACHING, PRINTING, ETC.

Cop Dyeing—Finishing Cotton Flannels—Bleaching and Dyeing Linen Thread—Mercerizing and Bleaching Skein Yarn—Waterproofing Fabrics—Finishing Cloth for Bookbinding—Dye Recipes . 176
MILL NEWS 188
PERSONALS 196
NEW PUBLICATIONS 200
BUSINESS LITERATURE 200
INDUSTRIAL NOTES 201
TEXTILE PATENTS 206
COTTON MARKET 233
WOOL MARKET 235
YARN MARKET 237
RAG AND SHODDY MARKET 247
DYES AND CHEMICALS 250

Correspondence.

We solicit correspondence on textile subjects. Articles accepted will be paid for. Name and address must always be given, not necessarily for publication. Subscribers are invited to make free use of our Questions and Answers Department; correspondence is strictly confidential.

Textile and Technical Books.

We sell all textile books at publishers' prices. We publish technical books, especially on textile subjects and make liberal arrangements with authors.

HOWARD & BULLOUGH,

AMERICAN MACHINE COMPANY, LTD.

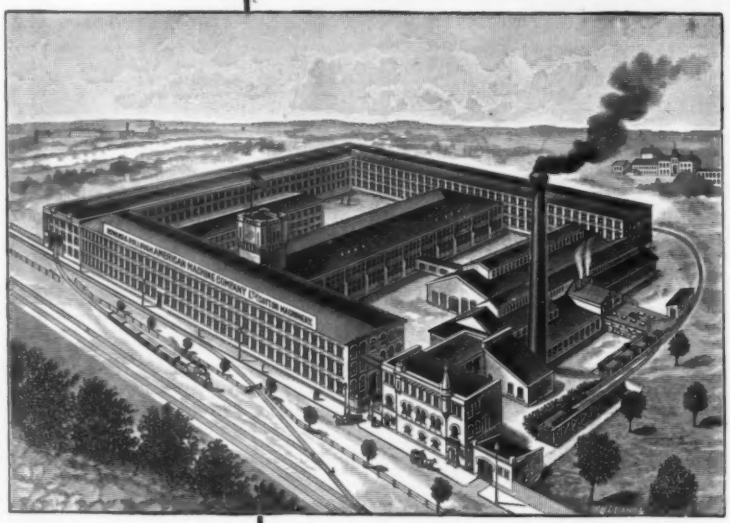
PAWTUCKET, R. I.

C. E. RILEY, TREAS.
BOSTON OFFICE, 65 FRANKLIN ST.

SOUTHERN OFFICE
814-815 EMPIRE BLDG., ATLANTA, GA.

COTTON MACHINERY

WE INVITE YOUR INVESTIGATION AND COMPARISON.



Hopper Bale Openers
Feeders
Openers
Breaker Lappers
Intermediate and Finisher Lappers

Rev. Flat Cards
Drawing Frames
Slubbing Frames
Intermediate and Roving Frames

SEND FOR DESCRIPTIVE CIRCULARS WITH LISTS OF USERS.

NEW PATTERN SPINNING FRAMES
IMPROVED TWISTERS
For Wet or Dry Work

CONE WINDERS
WARPERS
SLASHERS

THE LIBRARY OF CONGRESS, ONE COPY RECEIVED OCT. 14 1905 COPYRIGHT ENTRY Oct. 9. 1905 CLASS A XXc. No. 10363 COPY

TEXTILE WORLD RECORD

COMBINING

The Textile World and Textile Record.

VOL. 30. (NEW SERIES.) OCTOBER, 1905 No. 1.

Monthly Comment.

Fancy Yarn.

In this issue appears the first of a series of articles on the manufacture of fancy yarn. Beginning with the simple shaded effects obtained by dyeing and printing, they will treat of all the variations from the ordinary singly or straight ply yarn to the most complicated boucle or knotted yarns. The authors are James Dantzer, Professor of Combing and Spinning at the National School of Industrial Arts, Roubaix, and Charles Dantzer, Chief of Practical Works at the Industrial Institute of the North of France. The series will form the only treatise on the subject and will afford manufacturers an exceptional opportunity to obtain information that will enable them to produce fancy yarn for special effects. The series will include an article on estimating the cost of fancy yarn.

Asiatic Boycotts.

Following close upon the boycott of American goods in China, begun at Tientsin and concerning the extent of which much uncertainty exists, comes the report of a boycott of British goods in India, started as a protest against the division of Bombay into two administrative districts. The movement is directed principally against British cotton goods, which are imported into India at the rate of $150,000,000 a year.

Wool and its Substitutes.

The popularity of the smooth, worsted finish is the cause of an apparent anomaly in the textile market. While wool has advanced until fine medium territory is selling for 70 cents, scoured basis, the prices of woolen rags and shoddy have remained practically unchanged, with even a tendency in some quarters toward a decline. This is due to the fact that the worsted finish cannot be obtained with yarn made from short wool stock. The demand for cheap goods with that finish has, however, been supplied by the cotton worsted, and mills making these goods are well supplied with orders, while the carded woolen mills find it difficult to keep their looms in operation. There is, however, no ground for the prediction that the carded woolen fabric is a thing of the past. The smooth worsted and the cheviot finishes have their seasons of popularity, each alternating with the other in the favor of the consumer. At no time is the use of either entirely abandoned. While fashion plays the leading part in regulating the demand for goods, there is no question but that excessively high prices for any textile material, such for example as are prevailing in the domestic wool market at the present time, do exert an important influence in directing the course of fashion toward lower priced materials. We had an illustration of this a few years ago when high prices

for fine wools were followed by a restoration of coarse goods to the favor of the public. It would not be surprising if a continuance of the present prices for wool should hasten the return of the woolen cassimere and cheviot to their former position in the textile markets.

Welfare Work.

This is a term applied to the efforts of employers to promote the welfare of their employes in other ways besides providing steady employment at fair wages. At the recent meeting of the New England Cotton Manufacturers' Association, the subject was discussed by H. H. Vreeland, the general manager of the Metropolitan Street Railway Co., New York, who has been in charge of large bodies of workingmen for many years, and who has taken a great interest in "welfare work" in connection with such management. He is a man who has been promoted from the ranks to his present position, and is, therefore, able to speak on the subject from the standpoint of a workman as well as from that of a manager of help. This greatly increases the significance of the fact that he is strongly in favor of welfare work. While his experience has been confined to railroads, it is of great value in other industries.

The following extract from Mr. Vreeland's paper gives a very good outline of his views:—

It may be stated generally that employes will welcome all efforts properly introduced to provide for their physical, mental and moral welfare. An employer who is noted among his employes for fair dealing need have no fear in introducing welfare work after a careful study of conditions has been made. That is to say, after recognizing the first needs of employes to be steady work, an equitable wage and hours as short as competitive conditions will permit, the employer may successfully install welfare work, if proper attention is given to its introduction.

A clean, attractive lunch room with wholesome food at prices within the reach of the employes, will succeed; its opposite will not. Shower baths for molders in a basement room where the temperature is lower than in the foundry will not be utilized. On the other hand, shower baths easily accessible to the molding room with a temperature which will not be a shock to the system, kept in cleanly condition, and supplied with towels and soap and an attendant, will be not only a great comfort to the men, but an advantage to the employer, as the health of the men will thus be promoted and skilled workmen will seek employment where such comforts are provided.

An employer who gives no attention to the elimination of inequality in wages, but constantly cuts piece prices, without studying their fair adjustment, will find the employes unwilling to patronize a club house, which should afford much enjoyment, because of their suspicion that its cost has been taken from their wages.

This was well illustrated when, by the merest chance, the president of an overall manufacturing concern in Iowa found it necessary to cut the wages the very day of the opening of a lunch room which he had equipped. It is scarcely necessary to say that the employes would not go near it.

The successful prosecution of welfare work once installed depends upon its constant supervision. The employer and his executive force in the average concern are too much engaged with the routine business to study the needs of the employes or to oversee the conduct of the work which must receive constant attention to ensure interest in its continuance. And so, there has appeared what is called in different institutions the "welfare manager," "welfare superintendent," and "welfare secretary," who serves as an intermediary and helps to secure the personal touch which otherwise would be lost in our large business organizations of the present day.

The motive of the employer is one which comes before us constantly. While the economic value of welfare work must be admitted, it is pleasant to find that the average employer promotes welfare work from the humanitarian standpoint. It is not difficult to prove that it is desirable from a mercenary point of view. One may enumerate such advantages as the attracting of skilled employes who will seek work where the conditions are best; good discipline and self-respect, which may be secured through opportunities for cleanliness; a permanent set of employes as against a constantly changing force which requires effort to train and necessitates the loss of much material wasted; and a happy, contented class of workers.

What is called welfare work is not new. It is an inherent feature of the relation of employer and employed, and its prominence now is due to the extension of that relation to large bodies of employes and to more complex conditions. That it is of great value in the mental, moral and physical improvement of working people is indisputable. It is equally true that it has its limitations beyond which its extension does more harm than good. That the safe limits have been reached if not passed is evident from Mr. Vreeland's outline of the present scope of the work, which included such activities as housing the employes, supporting brass bands, savings and loan associations, distributing flower seeds, teaching domestic science, providing sports and recreation, drainage, water supply, providing churches, hospitals, bathing, ventilating and lighting work rooms, providing lunches and lunch rooms, seats and elevators

for women, fire protection, transporting the help to and from the factory, disability pensions, sick relief, accident insurance, burial funds, libraries, club rooms, inspection of operatives' homes, information bureaus, foremen's meetings and vacations without pay.

These things are all right in themselves, but many of them are not proper subjects for control by the employers in their individual capacity. Among these may be mentioned savings and loan associations, accident insurance and pensions. The objections to the conduct of savings banks and loan associations by employers are well known and confirmed by experience. Accident insurance controlled by employers is liable to serious abuses, such, for example, as that practiced by one of the leading railroads of the country and which consisted in the insertion of a clause in the insurance contract releasing the corporation from any liability for neglect in case of accident. Insuring and pensioning employes by employers are all right, but when developed into an organized system it is much better to place them under the control of the government, as has been done in Germany, where they are supported by taxation of both employer and employe. The Badische Anilin und Soda Fabrik, Ludwigshafen on the Rhine, previous to 1884, provided sick insurance for their employes, but in that year this feature of their welfare work was abandoned because of the enactment of a law providing for such insurance throughout the German empire. While the Badische system was excellent, it was but a stage in the evolution of workingmen's insurance, and its abandonment was inevitable when that system became a national institution.

Government control or supervision is desirable in many other branches of welfare work as outlined by Mr. Vreeland, and in all of them success depends on avoiding that spirit of paternalism which is apt to creep into such enterprises. This can best be avoided by placing such work under the control of both employer and employe and letting each bear his share of the expense. The employe may be as good a judge of what is for his welfare as his employer is, and he naturally resents any assumption to the contrary. He also resents, or should resent, anything done for him that resembles charity. These natural instincts are recognized in a practical way in the welfare work of the Hollywood Inn, Yonkers, N. Y., founded by W. F. Cochran, of the Alex Smith Carpet Co., and which is under the control and largely supported by the employes who are benefited by it. In this way a feeling of independence and equality is encouraged and the danger of softening the help by paternalism is avoided.

Cotton Goods in the Philippines.

As shown by the imports of cotton goods into the Philippines for the year ending Dec., 1904, the United States still continues to supply but an insignificant part of this trade. The figures for the principal countries are as follows:

Great Britain,	46.48 per cent.
Spain,	16.19 per cent.
United States,	6.64 per cent.
Switzerland,	6.64 per cent.
British E. I.,	5.97 per cent.
Germany,	5.42 per cent.
China,	4.08 per cent.
Japan,	3.58 per cent.
France,	1.42 per cent.
Other,	3.58 per cent.

The three largest items are loosely woven cloth, yarn and thread, and knit fabrics. Great Britain leads in the first two, having nearly 7 times as much as the United States of the first, and 200 times as much of the second. Spain leads in knit fabrics with 50 times that of the United States. The imports for the year are classified by grade as follows:

Cloths, closely woven,	$2,705,613
Cloths, loosely woven,	722,885
Wearing apparel,	149,851
Carpets,	421
Yarn and thread,	848,409
Quiltings and piques,	11,282
Velveteens, etc.,	20,423
Tulles and laces,	47,794
Knit fabrics,	749,863
Waste,	13,155
Other,	230,960
	$5,500,656

Although we supply but a small part of the cotton goods used in the Philippines, the ex-

ports to the archipelago for the year ending June of this year show a gratifying increase over the preceding twelve months, being valued at $767,309 for 1905 as compared with $253,371 for 1904.

The Turin Silk Weighting Congress.

One hundred delegates were present at the silk weighting congress, which began at Turin, Italy, on Monday, September 4. The countries represented were Italy, Austria, France, Germany, Switzerland, Great Britain and the United States. The English and American consuls were present as representatives of their respective countries.

M. Craponne, the president of l'Associazione Serica of Turin, outlined the program and the object of the congress, which is not to prevent the weighting of silk, but to discover means by which the purchaser of silk goods can control the proportion of weighting material in the goods he orders. He spoke of the adulteration of silk goods by excessive weighting and the unsuccessful efforts during recent years to stop the abuse, and urged congress not to relax the effort to regulate a practice which threatened serious injury to the silk industry. Papers were then read on the chemical and physical characteristics of silk and the methods by which the consumer could be protected against the adulteration of silk goods. One of the delegates proposed two plans. The first consisted in the use of an international mark or seal, placed under the control of public conditioning houses. The second, originally suggested by the Verein der Deutschen Textilveredlungs industrie of Dusseldorf, provided for a special selvage to be used on goods that come up to a certain standard of purity. The discussion of these proposals occupied two days and developed a sharp difference of opinion among the delegates. One party favored the regulation of weighting; the other was opposed to it. M. Ennemond Morel, president of l'Union des Marchands de Soie de Lyon, protested against the term fraud as applied to silk weighting, which, he said, was in reality a step in industrial development, since it placed silk goods within the reach of a vast number of consumers of moderate means. He declared himself an uncompromising opponent of every system of regulation.

The discussion was finally adjourned to the committee room, where it continued until midnight, and ended with an agreement on the following resolutions, which were subsequently adopted by the congress:

Resolved, That, while recognizing the impossibility of preventing the manufacture of weighted silk goods, it is necessary to afford the consumer means for recognizing fabrics made of pure silk and determining whether the goods offered to him are durable or not.

The Congress is of the opinion that if the vegetable charge is not injurious to the solidity of the fabric, the metallic charge is dangerous, and that an excess of the latter should be avoided.

A commission composed of delegates from the associations agreeing to the conclusions of the Congress will be empowered to study the question and put into practice the principles here announced. The commission will announce their conclusions within three months, which will then be submitted to the associations for approval.

The commission will also study the question of weighting and formulate subjects for discussion at the next Congress, which will be held at Como during the summer of 1906.

The Canadian Tariff.

It is the intention of the Canadian government to revise the tariff, and as a preliminary step a commission is making an inquiry to determine what changes are advisable. The public hearings began a few weeks ago in Manitoba, and will be continued throughout the Dominion in order to give the representatives of every Canadian interest an opportunity to make recommendations as to changes to be made. Already the Canadian wool growers are coming forward with a demand for a duty on raw wool, which is now admitted free. The woolen manufacturers, whose industry has been practically ruined by the preferential duty, are asking for higher rates on manufactured goods, and in order to be consistent will have to agree to a duty on wool. The conditions in Canada are in many respects like those prevailing in the United States. Wages are higher in every industry, and in order to develop the resources of the country it will be necessary to protect high-priced American labor in Canada against the cheap labor of foreign countries. In constructing a tariff law Canada possesses a great advantage in the fact that it has the history of the United States to guide it. The present

tariff in the United States is the result of long experience in fitting tariff rates to the needs of an American community. This experience has covered many industrial vicissitudes, and today the strong popular sentiment in favor of a high tariff in this country is due to the recollection of the comparatively recent hard times that followed an experiment with a low tariff. Canada may profit by the experience of her neighbor if she chooses, but it is human nature to learn only in the school of one's own experience, and consequently we may expect to see the present attempt to revise the Canadian tariff fall far short of giving adequate protection to the Canadian industry.

Markets and Markets.

The value of a foreign market depends not only upon the number of inhabitants to be supplied with merchandise, but also upon the quantity of goods used by the individual consumer. The average consumer in one country may buy as much as a dozen or more consumers in another country where the people are poorer. The statistics of the use of cotton goods in England, found in the report of the Chamberlain Tariff Commission, enable a comparison to be made between the American and English markets in respect to cotton goods.

That report places the annual consumption of cotton goods in the United Kingdom at $68,040,000, which is equal to $1.80 for each of the 37,733,000 inhabitants. In the United States the consumption of cotton goods, according to the U. S. Census, amounted in 1900 to $310,271,911, or $4.07 for each person. As consumers of cotton goods one American is equal to 2 1/4 Britons, the 80,000,000 consumers in this country being equivalent to 180,000,000 of such consumers as now are found in Great Britain and Ireland. Owing to the wealth of the United Kingdom, and the climate which necessitates plenty of clothing, it is a safe assumption that, as compared with the United States, it supplies the lowest ratio of any country outside of the Western Hemisphere.

Basing the estimate on the use of raw cotton a consumer in the United States is equal to 7 1/2 of the average consumers outside of this country. It follows that the ratio between the buying power of the American and that of the consumer in the poor countries of the tropics, such as India, China and the Philippines, for example, must be much higher. All of which leads to the conclusion that the first duty of Americans is to keep the home market for American producers.

Fixed Charges and Short Time.

The following statement made up from the books of a leading English cotton spinner and weaver for the Chamberlain Tariff Commission shows the fixed charges of his mill for a period of six months and also the production of the mill when running full time, which is 55 1/2 hours per week in England, and short time, 33 hours per week, the fixed charge remaining the same for both schedules:

Items.	Spinning.	Weaving.
Insurance	$230.98	$262.91
Interest	925.82	902.28
Oil and Tallow	433.58	107.30
Stationery	23.29	23.29
Taxes	685.63	685.63
Petty Cash	301.08	286.50
Salaries	1,560.16	1,619.76
Depreciation	2,152.67	2,152.67
Coal	1,703.27	2,223.99
	$8,016.48	$8,264.33
Production, full time,	895,000 lbs.,	158,687 pieces
Cost, full time,	$.00896 per lb.	$.052 per piece
Production, short time,	564,414 lbs.	100,073 pieces
Cost, short time,	$.0142	$.0825

As it requires 9 lbs. yarn to make a 10 lb. piece of shirting the cost of fixed charges in spinning and weaving 1 piece of shirting under full time and short time was as follows:

	Full Time.	Short Time.
Spinning 9 lbs.	$0.0806	$0.1278
Weaving 1 piece	.0520	.0825
	$0.1326	$0.2103

The increase of cost for fixed charges under short time was $0.0777 or 58 per cent. This increase on the 100,073 pieces woven amounted to $7,775.67, which is the loss to the manufacturer on fixed charges alone. In addition there is the unavoidable increase in other than fixed charges, which always occurs when a mill is running on short time.

An International Cotton Conference.

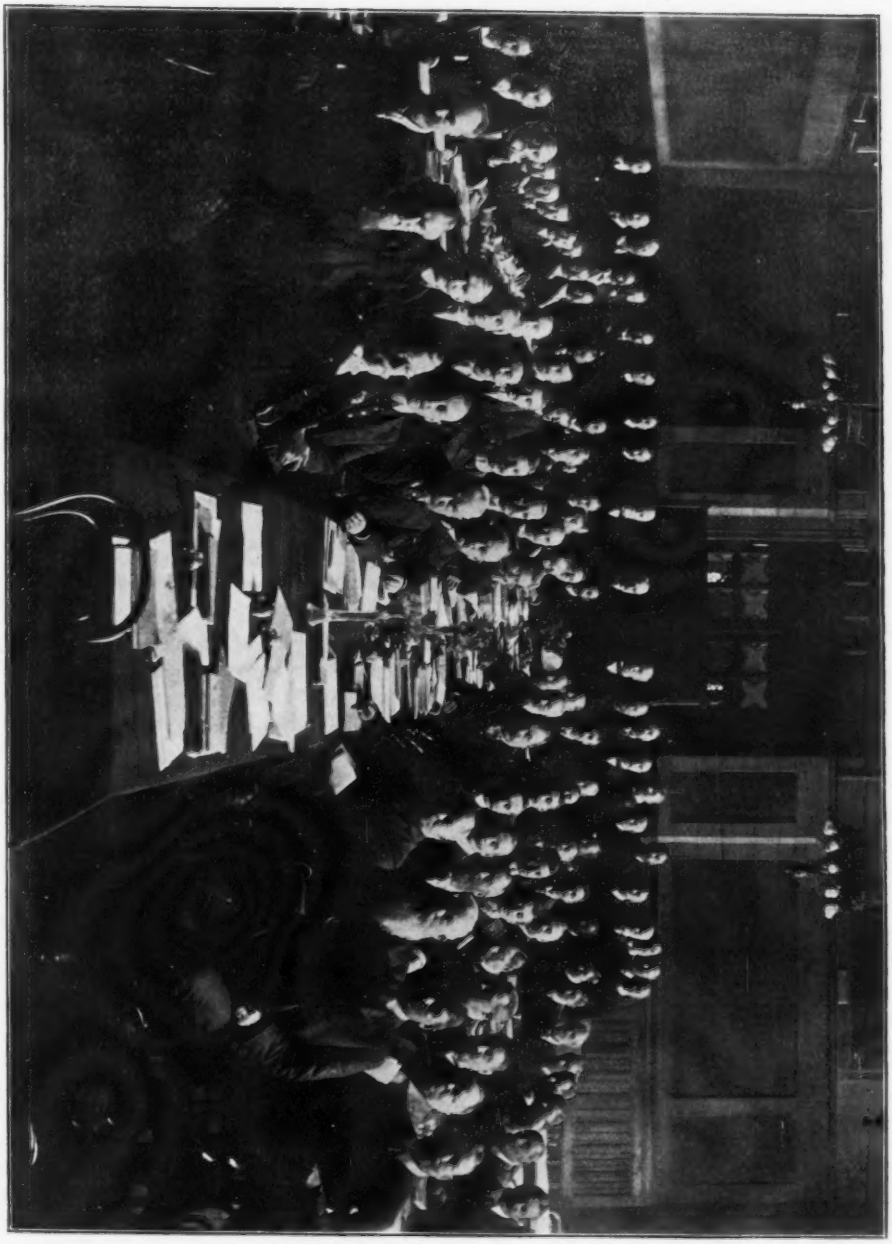
The cotton manufacturers of Europe, organized under the name of the International Federation of Cotton Spinners' and Manufacturers' Associations, have held two congresses, the first at Zurich, Switzerland, last year, during a scarcity of cotton, the second at Manchester, England, last June, during a time of unexampled prosperity in the European cotton trade. The Federation was established by a combination of the powerful local cotton manufacturing associations throughout Europe, and, measured by the manufacturing interests represented, became at once the most important textile association in existence. It represents cotton mills with a capacity of 85,000,000 spindles, four-fifths of the world's cotton machinery, giving direct employment to more than 1,500,000 operatives and using 8,000,000 bales of American cotton a year. The illustration on the opposite page shows the delegates to the second International Congress of this federation assembled at Manchester Town hall, within twenty miles of which 47,000,000 cotton spindles, nearly one-half of the world's cotton machinery, were in operation. It is this powerful federation of cotton manufacturers that is to be invited to send delegates next April to the convention of the New England Cotton Manufacturers' Association. It is also the intention of the last-named association to confer with other manufacturing associations and with the Southern Cotton Association regarding the advisability of holding at the same time a joint conference of the representatives of the cotton growing and manufacturing industries of Europe and America.

It is difficult to overestimate the benefit to be derived from such a conference. First of all it would remove many misunderstandings by bringing representatives of the cotton growers and American and European manufacturers face to face. It would enable them to understand that there is no more conflict of interests between grower and spinner than between spinner and weaver; that all three represent processes of the same great industry by which cotton is grown and converted into cloth for clothing mankind. It would show that there is no stronger rivalry in cotton manufacturing between America and Europe than there is between Lancashire and Barcelona, Lowell and Fall River, Charlotte and Atlanta, or between any two mills on the same grade of goods in any part of the world. Having recognized their community of interests, growers and manufacturers could work together to promote those objects that are for the common good. The proposed international conference offers a great opportunity to the cotton trade of the world, and if brought about should be conducted on the broadest possible lines, without a trace of sectionalism or undue prominence of special interests.

Statistics of Cotton at the Mills.

Under the authority granted by Congress last winter, the Census Bureau is collecting statistics of the stock of cotton at the mills and the consumption of cotton during the past year. Only three questions are asked. These relate to the raw cotton of domestic growth in the mills Sept. 1, 1904, including all raw cotton of domestic growth in the actual possession of the mills Aug. 31, 1904, both raw stock and that being picked; the total raw cotton of domestic growth received at the mills from Sept. 1, 1904, to Aug. 31, 1905, inclusive, including all domestic raw cotton received at the mill during the year, less any resold; the total consumption of raw cotton of domestic growth from Sept. 1, 1904, to Aug. 31, 1905, inclusive, including all domestic raw cotton passed through the pickers at the mill during the year.

This information can be supplied by the mills without difficulty and will enable the Census Bureau to determine very closely the invisible stock of cotton on hand and the probable requirements of the domestic mills. If carefully compiled for a number of years the statistics will acquire additional value for purposes of comparison. The value of the



THE INTERNATIONAL COTTON CONGRESS, IN THE TOWN HALL, MANCHESTER, ENGLAND, JUNE 9, 1905.

figures, however, will depend entirely on their accuracy, and this can be assured only by efficient supervision in the Census Department and by general co-operation on the part of the manufacturers. To realize the full benefit from statistics of invisible stocks and consumption they should include the mills of the whole world. Without a knowledge of how much cotton is in the possession of and consumed by foreign mills, such information relating to American mills alone would be of but slight value to the trade. The question of compiling such statistics for the mills of Europe was discussed at the International Cotton Congress at Manchester, Eng., last June, and the Committee of Management was authorized to undertake this work. It is very desirable that the same system of collecting these statistics should be adopted in all countries to enable the results to be summarized for the whole world with the least chance of error. For this reason it would be an excellent plan for Arno Schmidt, Secretary of the International Federation of Cotton Spinners' and Manufacturers' Associations, 22 St. Mary's Gate, Manchester, Eng., to get into communication with S. N. D. North, Director of the Census, Washington, D. C.

Tussah Silk Waste as a Wool Substitute.

Tussah silk is a wild variety found in various parts of Asia. Much of it is collected in a form unfit for reeling and is marketed as silk waste. It is of a tan color, the fibre containing considerable gum and foreign matter, which must be removed before dyeing. The removal of this gum is the most difficult operation connected with coloring the silk, as the dyeing process itself is the same as for any raw material. The price of the waste in its raw state varies with the condition of the market, at the present time being about 20 cents per pound. It is admitted into the United States free of duty.

The fibre is long and woolly, the stock in its raw state bearing a very strong resemblance to pulled wool. It is dissolved in hot solution of caustic alkali and thus cannot be distinguished from wool in the finished fabric by this test. We are informed that it carries short wool stock well. The possibility of weighting this stock in dyeing should be considered. As is well known, silk possesses a strong affinity for certain salts, it being possible to increase the original boiled-off weight as much as 200 per cent. This quality should enable dyers not only to prevent any shrinkage in scouring and dyeing, but even to increase the weight, providing such treatment did not injure the spinning and finishing qualities of the material.

Woolen Goods in Mexico.

The imports of woolen fabrics into Mexico amount to about $500,000 per year. About two-thirds of this trade is divided in nearly equal proportions between France and Great Britain. For the month of December, 1904, this class of Mexican imports amounted to $34,935 (U. S. currency, Mexican peso, 40 cents) divided as follows:

France	$12,243
Great Britain	11,585
Germany	6,809
United States	2,388
Belgium	1,623
Austria	166
Spain	121
	$34,935

During the last few months the cotton trade has been in an exceptionally prosperous condition, very large profits having been made by spinners and manufacturers, who are mostly engaged for many months ahead. Although the best of this business may be over it looks as if they would be prosperous for the remainder of the year. The causes of all this are very abstruse. It is due partly to the exhaustion of stocks of manufactured goods throughout the consuming markets of the world, owing to the small cotton crops of the last few seasons and consequent high prices; partly to the bountiful crop of this season; partly also to a certain dislocation of the textile trade conditions by the Russo-Japanese war which has operated favorably to this country.—British Tariff Commission.

Seasonable Fabrics.

MEN'S WEAR WOOLENS.

There is an apparent deep seated feeling of satisfaction prevailing throughout the district. The selling agents are enthusiastic, congratulating themselves upon having the best season in the history of the trade.

The annoying cancellations have for the time subsided, leaving a volume of business that the mills will have to use their utmost endeavor to deliver on time; this apart from the duplicate and supplemental business which is due to be received in a few weeks' time. This condition is gratifying because the prices secured have in all instances been remunerative, and hence ensure a profitable termination to what looked at one time as abnormal and uncertain.

The majority of the orders placed call for staple lines of worsteds and the position of the worsted mills is, relatively speaking, much stronger than those that devote their looms to the production of woolens.

Medium grade serges have been bought in very liberal quantities, while all piece dyed fabrics have received strong support.

Fancy worsted mixtures have been the most extensive sellers of all the fabrics in the men's wear division; ranging from the lowest to the highest grades.

The designs called for in these mixtures are for modest neat effects, loud patterns have fallen flat, but the gray oxford, neat overchecks and small stripes have everywhere been bought quite liberally. Recently there has been a continual call for an additional supply of kerseys, also for broadcloths and thibets, and it appears as if thibets have secured a new lease of life; predictions have often been made that a few months would see the fabric completely out of the market, but the orders booked this month upset that theory.

Complaints are made by the clothiers that fall deliveries are extremely dilatory, thereby causing annoyance, loss and inconvenience.

The tendency is still upward and what new business is now being placed is at an advance of 2 1/2 to 5 cents a yard; this is more particularly true as to kerseys and broadcloths.

DRESS GOODS.

Business for next spring's requirements has been rather limited in volume, but now the style tendencies are gradually developing, and it is claimed by the importers that light weight sheer fabrics similar to the batiste weave will predominate. Such fabrics are now extensively shown by a number of the agents representing French and German manufacturers.

Silk and wool poplins, eoliennes, and silk and wool crepes are spoken of as likely to be the vogue for dressy costumes, also small checked voile and pin striped batiste. Chiffon finished broadcloths will probably continue in favor throughout early spring; while gray worsted and checked mannish tweeds will be extensively bought for outdoor rough wear.

The cutters have placed some orders for mixed homespuns, which are now shown in small plaids and checks, and a variety of stripes.

For current wear chiffon broadcloth is distinctly the most prominent of all dress fabrics, and is shown by all the leading houses in a numberless range of shades, comprising plums, mahoganies, raspberry, several shades of green from the reseda to the hunter's green, as well as the standard staple shades, and in addition the pastel colors in soft blue, pinks, cream and biscuit. Then henriettas are shown in a profusion of shades, and are spoken of as being a good second: after come voiles, panama weaves, plaids and mohairs.

Mohairs deserve special mention for the reason that every indication points to their continued popularity, notwithstanding the fact that they have been prominent for a number of years, and also for the reason that the Bradford manufacturers are now showing collections wider in scope, in excellence and designs, than have hitherto been shown in the market.

The different weaves consist of granites and sicilians with jacquard dots, warp prints, melange, shadow check, blue and green plaids, green overplaids, gray checked and stripes. Cream mohair promises to be

more in demand during next spring and summer than ever before.

SILKS.

Generally speaking the volume of business transacted is disappointing to the manufacturers without knowing exactly where the trouble lies; this has been the situation in regard to the fall demand, and apparently there is little improvement manifested concerning the requirements for spring. While this weakness continues it is impossible to secure adequate returns from the money invested in plants and raw material, with the result that manufacturers find themselves on the horns of a dilemma, for raw silk has materially advanced in price, yet they are unable

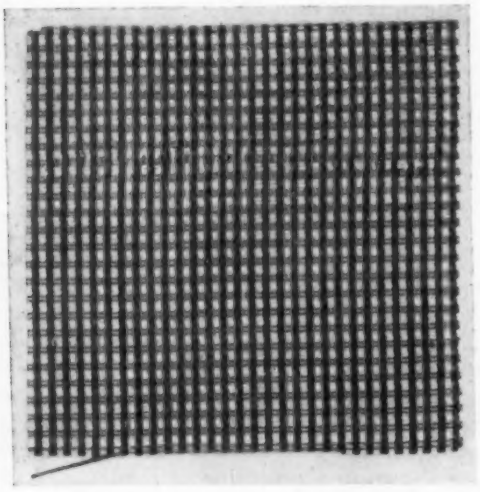


FIG. 1.

to dispose of their production even at the old prices.

It is probable, however, that an improved condition will take place as the season progresses, as the silk business is always better in the spring than the fall.

Broad black silks are taken in liberal quantities by the cutters, as well as the retail trade.

Peau de soies are not as strong as they were a month ago. Among the fancies, moires are in the ascendant and are shown in a bewildering variety, and perhaps this fact will cause their speedy decline. Fig. 1 is a black and white shepherd's check moire sold by Valentine & Bentley at 72 1/2 cents, 22 inches wide.

Plain colored taffetas are considered staple fabrics, and there is little diminution in the demand. A good serviceable quality in 19 inches can be secured from a number of the manufacturers at 52 1/2 cents.

Tartan plaids intersected with floral wreaths are shown by Dexter Lambert & Company at 90 cents, and the difficulty is to secure prompt deliveries.

Predictions are made that the soft finish lustrous goods will prevail for the spring, such as chiffon finished taffetas, pompadour louisines, foulards, embroidered figured open stripes, and Japanese silks.

VELVETS.

With the advent of cold weather velvets have experienced somewhat of a boom, and their position today is considered strong. A brisk demand has arisen from every part of the country. Chiffon weights are among those favored by consumers, largely on account of their sheer construction and adaptability for dressy gowns. Several shades of green, blue and plum, and a variety of reds are the prevailing colors.

COTTONS, PRINTS AND GINGHAMS.

Prints, ginghams and sheetings, bleached and brown goods, have sold heavily, and the commission men as well as the jobbers state that this has been the best season in years.

Activity in all lines has been marked with quotations well maintained. The buyer's efforts to secure concession has almost in all cases proved fruitless.

J. Harper Poor & Co. are showing their new spring "toile du nord" gingham, which they restrict the jobber to sell at 9 1/2 cents. Although this ticket is considered high at above figure in comparison with other brands of dress and shirting gingham, the whole product of the mill was absorbed in a few days, and delivery on new business cannot now be made before April or May.

Another of the prominent tickets is the Bates which is looked upon as one of the staples and sold by the jobbers at 9 cents.

The Amoskeag A. F. C. is probably the best known of the standard tickets, the agent's price being 8 1/2 less 10 per cent. and 2 per cent., and the jobbers'

8 1/2 cents less 5 per cent. and 2 per cent. The Red Seal is quoted by the jobbers at 8 cents net.

The difficulty experienced is not to dispose of the mill product of these tickets, but how to distribute them equally among the various jobbers.

from road men indicate a large volume of business for the importers and manufacturers of all classes of white goods. It is possible that the question of supply will prove harder to solve than how to secure enough business. During the month an advance of 10 per cent. has taken place on India linen,

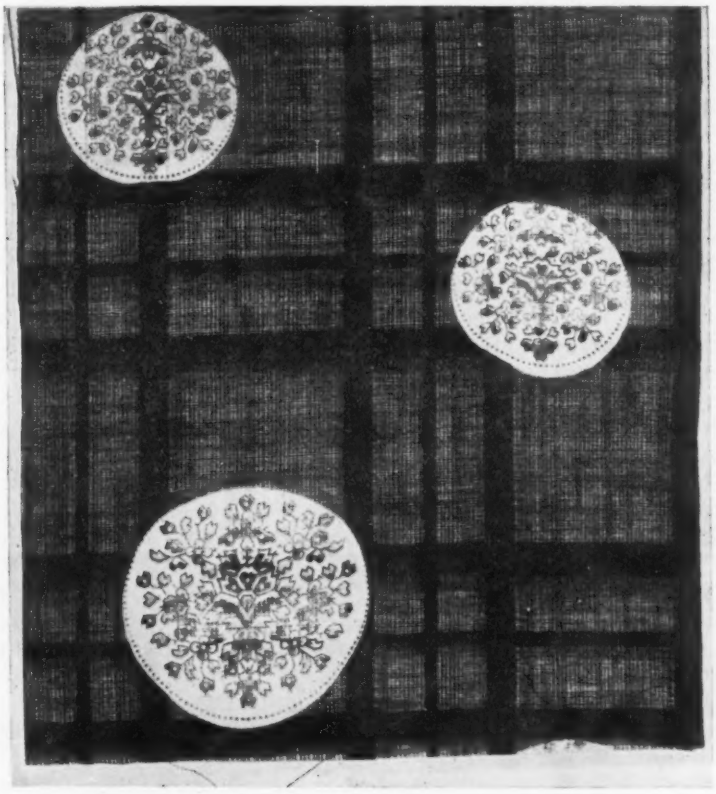


FIG. 2.

The most prominent among the new designs consist of two-toned jacquard figures with a decided improvement in tartan checks and plaids.

Flaked designs which were shown last season have now been eliminated in the new collections, and the tendency is toward chambray weaves in quiet colorings.

The collections also comprise a number of small black and white stripes, suitable for shirting patterns.

WHITE GOODS.

The outlook for the spring trade is most favorable, and the orders now coming in

victoria lawns and goods of that character. The feature of this division of the market has been the strong and continued request for dotted Swisses, more particularly for the low numbers around 10 to 15 cents.

Among the novelties that are shown by the importers are the embroidered cambrics, embroidered Swiss and embroidered linens in a large variety of small beautiful designs.

Hand embroidered soft finished pique also deserves mention as a beautiful fabric for waisting purposes.

Some new and beautiful designs have been brought out in printed organdies in

white and black and colored grounds. Fig. 2 illustrates one of Welman's productions in this line brought out by Robert McLea & Company and sells at 36 1/2 cents.

LININGS.

The call for linings has materially fallen off, but percalines continue in fair request.

Silesias are also taken in moderate quantities.

The movement of mercerized fabrics for the moment is not up to the average, but this is due principally to the fact that the clothiers have covered on their necessary requirements through their initial purchases, and duplicates cannot be expected for another month.

TUSSAH SILK WASTE IN EUROPE.

Bradford, Eng., Sept. 30, 1905.

Editor Textile World Record:

From the reference to Tussah silk waste on page 68 of your September issue I judge that the merits of this stock as a wool substitute are just beginning to be recognized in America. It has been used in England from time immemorial, but the higher cost of wool on your side greatly increases the value of Tussah waste for that purpose. The price of the material is subject to rapid fluctuations and it is my opinion that Asiatic Tussah will soon be put at a price that will make substitutes for that material very welcome discoveries. Following are the leading firms that supply waste silk to English spinners: Kidd, Boden & Co., Manchester; T. H. Gaddum & Co., Manchester; R. J. Ferguson & Co., Brighouse; Harry Ferguson, Bradford; Marsden & Hunter, Bradford; Hetherington & Anderson, Bradford; Sydney Thompson, Nottingham.

These are the firms that usually supply the Bradford wool exporters with such forms of waste silk as they occasionally deal in. Our silk wastes are nearly all brought over by the following firms, who are Eastern import and export merchants with European branches: *Arnhold, Karberg & Co., 5 East India Ave., London; *Matheson & Co., 3 Lombard St., London; *Carlowitz & Co., Hamburg, Germany; *E. Bavier & Co., Lyons, France; *Reiss Bros. & Co., London; Gayet, Gourmond & Co., Lyons, France (Continental waste); Buzzoni, Fraschini & Co., Manchester (Continental waste).

The names marked with (*) are of firms supplying Kidd, Boden & Co., and the others in the first list; I question whether they would deal directly with manufacturers. A Boston or New York importer prepared to buy from them would have to accept a four months' bill against pro forma invoice and documents and would have to pay cash before delivery for Eastern waste.

Those who sell to our silk spinners sell on a three months' prompt, with 1 per cent. brokerage and 1 shilling a bale clearing charges. They allow deliveries to be made piecemeal, either against cash or seven days' credit. An advantage about dealing with people in the first list is that they can offer all sorts of waste—not needfully Asiatic—which might serve a manufacturer's turn temporarily. Some of these firms also have casual supplies of material from China and India, some of it no doubt imported at first hand. For this country the firms marked (*) in the second list have special arrangements with brokers, sometimes exclusive ones. I believe that all Matheson & Co.'s (Jardine Matheson in China) English business is with Kidd, Boden & Co., and all Arnhold, Karberg & Co.'s with Sydney Thompson. Some of the brokers are speculative and it may not always happen that their prices are higher than the importers. TUSSAH.

The following American dealers can supply Tussah silk waste, viz.: H. de Veer, 260 W. Broadway, New York; Jas. E. Daly, 72 Leonard St., New York; Frank A. Tierney, Wool Exchange Bldg., New York.

The Germans make an artificial wool yarn from wood wool; imitation yarns from very low class Indian cotton, cotton waste and broken-up cotton materials; a mixture yarn consisting sometimes of 20 per cent. wool and 80 per cent. cotton, and running to 60 per cent. wool and 40 per cent. cotton, which is sold as pure wool and used on account of its cheapness in Lancashire, in flannelettes, while noil yarns made from cotton cloth waste are used by finishers.—British Tariff Commission.

Meeting of the New England Cotton Manufacturers' Association.

The seventy-ninth semi-annual meeting of this association, held at Atlantic City, N. J., was called to order on Wednesday morning, September 20, by President MacColl. After a report of the proceedings of the last meeting had been read by Secretary Woodbury, a committee on resolutions, consisting of President MacColl, William D. Hartshorne, Geo. A. Ayer, George O. Draper and Arthur H. Lowe was appointed. A notice was given of a proposed amendment to the by-laws, increasing the Board of Directors from six to nine members. The association was then welcomed by Governor Edward C. Stokes of New Jersey, who delivered a very witty and appropriate address, which put everyone in good humor. Mayor F. P. Stoy followed, welcoming the association to Atlantic City. A response to the governor's and mayor's addresses was then made by Herbert E. Walmsley of New Bedford, Mass., after which President MacColl delivered

PRESIDENT J. R. MCCOLL.

THE PRESIDENT'S ADDRESS.

BY JAMES R. McCOLL, Pawtucket, R. I.

Gentlemen of the New England Cotton Manufacturers' Association:

It gives me much pleasure to welcome you all to the Seventy-Ninth Convention of our Association.

These annual excursion meetings, begun in 1894, have been of value in bringing the Association into closer touch with its members located in various parts of the country; they have also afforded de-

lightful opportunities for the cultivation of social and friendly relations among the members and their guests. In past years we have visited several large cities, and have also met repeatedly among the mountains, but this is the first occasion on which we have gathered at the seashore. I trust that this city on the ocean will prove equally attractive from a social and health-giving standpoint, and that the wider outlook to the sea may be typical of the future development and work of our Association. It suggests also the present attitude of the cotton industry of our country, which now, in common with other industries, is looking across the seas for the enlargement of its trade.

Cotton manufacturing has lagged behind other branches of commerce in recovery from the depression of 1903. The extreme fluctuations in the price of raw cotton, and the consequent disturbance to values of manufactured goods, tended to destroy the confidence of buyers, and to encourage them to continue too long an indifferent policy. The condition of our industry now, however, is healthy and prosperous. Improvement came, first of all, from an increase of foreign trade. For the year ending June 30, 1905, the total exports of cottons amounted to over $49,000,000, in comparison with $22,000,000 for the preceding year, ending June 30, 1904. Of the $27,000,000 increase, $24,000,000 are additional exports to China. There has also been a growth of trade with Japan, the Philippine Islands, Cuba, and several countries of South America. The large foreign demand has withdrawn thousands of looms from domestic fabrics, with the result that mills equipped for coarse goods are all extremely busy, and prices have advanced to a profitable basis. Within the last few months the demand for medium and fine fabrics has been continually improving, and we are now beginning to share in the activity of other industries and the general prosperity of the country. Stocks are light, buying is active, prices are improving, and there is every evidence that another period of activity and expansion is at hand for the cotton manufacturing trade.

Remembering the multitude of outside attractions which Atlantic City affords, and the interesting and important papers to be read at this morning's session, it is not my intention to weary you with a long address. There are, however, a few subjects of common interest to us as cotton manufacturers which I wish to refer to briefly. The first is foreign trade.

A time of depression always has the effect of arousing effort to find new outlets for goods, and recently there has been more than usual interest in this subject. The total world exports of cotton goods amount annually to about $700,000,000. Great Britain alone exports over $400,000,000. Previous to 1905 the highest record of the United States was only $32,000,000. The fact that 80 per cent. of the world's cotton is raised in this country and that 60 per cent. of American-grown cotton is sent abroad to be manufactured, calls attention still further to the meagreness of our foreign business. The impression prevailing in some quarters that our producing capacity has forged ahead of our consuming power, has some measure of justification. In the last ten years the population of the United States has increased 20 per cent.—from 69,000,000 to 83,000,000; but in the same period the cotton spindles have increased 46 per cent. from 16,000,000 to 23,500,000. Compared with any previous time in the history of the country, this shows a much larger ratio of productive capacity to population. In the preceding decade, ending June 30, 1895, the population increased 25 per cent., and the cotton spindles only 20 per cent. It must be remembered also that in recent years the producing power of a spindle has been greatly augmented by higher speeds and other improved conditions.

Another reason why we should give attention to foreign trade is, that a wider range of markets might to some extent render less acute the cycles of depression, which invariably alternate with times of activity.

With all these considerations in view, there is, in my opinion, an urgent call to endeavor in every way possible to cultivate and extend our exports. We are now supplying not over seven per cent. of the world's exports, and the consuming power of the world has by no means reached its limit. In India, China, Japan, South America, and Africa there are still tremendous opportunities for larger consumption. We must reach out with might and main to secure a far larger share of this great and ever-growing trade.

We should not, however, allow momentary enthusiasm to blind our eyes to the influences that tend to restrict foreign commerce; nor is it wise to advocate any policy that may have the effect of destroying our home market, which is the best in the world.

The population of the United States has doubled in the last thirty-two years, and the wealth of the country has tripled. In the same period that our population has increased from 41,500,000 to 83,000,000, the population of Great Britain has increased only 10,000,000; of France, 2,000,000; of Germany, 16,000,000. The struggle to secure foreign trade is therefore essential for these countries, if they are to maintain their standing, as some of their export markets are continually being partially lost by hostile tariffs and competing foreign production. For example, the increase of spindles in the last ten years in India has been 35 per cent., and in Japan, 200 per cent. With peace restored, we shall undoubtedly see in the near future great expansion of cotton manufacturing in China and Japan.

In our rapidly growing domestic market, lies one obstacle to the development of exports. Business follows the line of least resistance, and in prosperous years looms and spindles find employment readily in supplying the home demand. With our population increasing at the rate of over 1,500,000 per annum, and destined to be 150,000,000 in thirty to thirty-five years, it is not unreasonable to say, that without any abnormal growth of foreign trade, this country will probably then have surpassed Great Britain in the number of its spindles and the volume of its output, and have become the greatest cotton manufacturing country of the world.

Another restricting influence is found in the special requirements of foreign countries with regard to count, weight, finish, methods of putting up, terms, etc. Fitful attempts to meet these requirements are of little avail. To attain success, we must cultivate this trade continuously, and not only in dull times when we have a surplus to dis-

lose of. We must meet and overcome innumerable difficulties that are incidental to any new business. Vigorous efforts are being made to secure the necessary information. Our consuls are continually sending home valuable data, and the Bureau of Manufactures recently created by Congress has sent out special agents to several countries to investigate the opportunities for American goods. Their reports are now being received, and are full of valuable suggestions. For example, Special Agent Hutchinson writes as follows:

"The people cling tenaciously to the kinds of goods to which they have been accustomed; the sizes, shapes, weights, marks, names, nationality, colors, even the shapes, sizes, and colors of the packages; all these and many other minutiae play a part which no one can appreciate who has not had actual experience here. American manufacturers and exporters do not pay the proper amount of attention to these seemingly foolish details.

"One reason which leads importers to purchase European goods rather than American, is the unwillingness of American exporters to extend credits as freely as their transatlantic competitors. Among the older and better known importing houses here this complaint is not often heard; but new firms, and even old ones attempting to open new connections in the United States, find this unwillingness a direct handicap.

"There is universal complaint as to the American methods of packing goods for shipment.

"Much complaint is made as to the spasmodic character of American enterprise.

"This last complaint really strikes the keynote of the whole difficulty; American exporters have not met with greater success here largely because they have not made sufficiently persistent effort. There is not an importer here with whom I have talked, whatever his nationality, who has not told me emphatically that there is a big trade awaiting the Americans the moment they are ready to take hold of it with persistence and determination."

The consuls and special agents are also calling attention to the need of improved mail and transportation facilities. We need a great era of shipbuilding if we are to be a great exporting nation.

Efforts are being made to induce the Government to appoint a commission of cotton experts to visit foreign countries in the interests of our export trade. A thorough investigation and full report by competent men would unquestionably be of great value at this time, and I most heartily endorse this movement. It cannot, however, be too often repeated that the work of the Government is only a preparatory contribution to the subject, and that individual enterprise and energy will be required by our manufacturers and commission merchants to enable them to meet the conditions and get the business.

In attempting to secure the trade with the Latin-American countries we have to compete with large foreign commission houses devoted exclusively to textiles. They have a half century of experience, established branches, resident agents speaking the language of the country, a thorough knowledge of the requirements of the market, and facilities in Europe to obtain the exact goods that are desired.

Initial difficulties will undoubtedly be met and overcome in course of time. As you are aware, the reciprocity treaty with Cuba gives the United States a preferential reduction of 30 per cent. on cotton goods. The consequent increase of trade is doubly valuable. We are learning the needs of Cuba, and at the same time getting a great deal of information which will be useful in exploiting South American markets.

The most important hindrance to foreign business in many classes of fabrics, lies in cost of production. The American manufacturer starts with a plant costing 50 per cent. more than that of his foreign rival. Many of the most modern and up-to-date mills are equipped almost entirely with English machinery, on which a duty of 45 per cent. has been paid in addition to packing charges, duty on packing, and freight. Wages are from 25 per cent. to 100 per cent. higher than competing European rates, according to the class of work and the section of our country, Southern wages being, of course, considerably lower than Northern. The difference in wages has been equalized in some departments of work by improved American machinery and methods of operation, while in other classes of work no greater quantity is turned out by an operative to balance the extra wages, which, therefore, add proportionately to cost of production.

Exports have been mainly in heavy, coarse goods, on which the element of labor is small and the output large. On this class of fabrics, American mills can successfully rival European mills. On other fabrics, careful investigation shows American costs to be 10 to 50 per cent. more than foreign, according to the labor involved in production, and the degree of success attained in inventing or utilizing labor-saving devices. With an average duty of over 50 per cent. collected on manufactures of cotton during the year ending June 30, 1904, the imports amount to $50,000,000 foreign value, proving conclusively that many fabrics can still be produced abroad at a cost of 33 1/3 per cent. less than here.

This, then, is the problem of problems, and also the opportunity, facing cotton manufacturers: How to pay high American wages, and at the same time by invention and organization, produce goods cheaply enough to sell abroad, in competition with goods made in Europe under a much lower wage schedule.

It is at present out of the question to reduce costs by lowering wages. Other industries are attracting employes, the cost of living is not diminishing, and there is no surplus of competent help. It is interesting to note in this connection the tendency throughout the United States to equalize wages and hours of labor. It is stated that at least one large mill in South Carolina is running on a sixty-hour basis, the legal standard being sixty-six, and in Connecticut some mills run fifty-eight hours, the legal standard being sixty hours. As regards wages, there are instances recently of help in New England being induced by tempting offers to migrate to Southern mills.

As long as we confine ourselves to the domestic market and have an adequate protective duty on competing foreign goods, it is not necessary to pay much attention to foreign cost of production; but if we are going out into the world to compete

with European manufactures, we must analyze carefully every item of cost in comparison with those of our foreign rivals.

Every monopoly, or combination of capital or labor, that tends to augment improperly the cost of manufacturing or the cost of living, is a menace to foreign commerce. By a kind of endless chain process of advancing wages in one industry after another, and at the same time adding to the cost of living, we may gradually be getting on to a dangerously high basis, compared with Europe and the Orient, and the process of climbing down may be uncomfortable later on.

Other difficulties in the way of foreign trade would soon disappear if costs were low enough to make the business pecuniarily attractive.

To sum up the situation, the allurements of the domestic market, the peculiar requirements of the export trade, and the difficulty of competing in price with foreign manufactures, are influences tending to limit our export business in cotton goods. In the last analysis, comparative cost will be the determining factor in export trade.

When we attempt to sell abroad the lighter-weight, finer, and fancy fabrics, these hindrances will become more apparent, and will tax still more our resourcefulness and energy. A comparison of the exports of the United States and Great Britain by classes of goods, shows that our principal business has been in grey and bleached goods, and that in the other classes which involve the complications of color and design, we have done hardly anything. The future opportunity, therefore, lies particularly in the latter classes.

Grey and bleached cotton cloths exported last year from Great Britain were valued at $179,000,000; from the United States, $34,000,000, equal to 19 per cent. Colored cotton cloths, including printed and dyed, exported last year from Great Britain, were valued at $141,000,000; from the United States, $7,000,000, equal to 5 per cent. It is worthy of note, also, that the exports of cotton yarn last year from Britain amounted to $45,000,000, and from the United States, only $310,000, or less than 1 per cent.

Hard times such as the cotton industry has recently passed through, serve a valuable purpose in teaching the necessity of maintaining plants in a high state of efficiency, and of estimating as an element of cost, a sufficient amount for depreciation and replacement of old machinery. In prosperous times poorly-equipped mills often make good showings, but when keen competition comes they are unable to stand the strain. The march of improvement in machinery is rapid. Invention, improvements in methods, restless progressiveness, are national characteristics. Our Association is useful in bringing together so many practical mill managers, thus affording opportunity for comparison and interchange of ideas. It is the aim of the Board of Government to obtain papers on all improvements of importance, but for various reasons this is not always practicable. We were disappointed in being unable to secure for this meeting, papers on several interesting topics, but hope that they will be ready for our April gathering.

The International Federation of Cotton Spinners and Manufacturers is assuming an important place in the cotton world. Two congresses have been held, the first in Switzerland, in May, 1904, and the second in England, in June of this year. One of our countrymen was present at the last congress, and at this meeting will present a report of its proceedings. The purpose of the organization is "to watch over the common interests of the industry, and to advise spinners' and manufacturers' associations of the action to be taken to protect their interests against any common danger." Previous to the formation of the International organization, the English Federation, in order to destroy speculative cornering of cotton, inaugurated a movement to curtail production. This curtailment was carried out successfully for several months. Recently the International Congress has recommended that spinners should not buy cotton during August, September, and October, having ascertainel from the delegates of the several countries represented, that spinners have an ample stock on hand to enable them to carry out this policy.

The influence of this organization is also used to encourage cotton growing in countries other than the United States. On this point there probably is not a complete identity of interest between foreign and American spinners. We should prefer to see an ample supply of cotton for the world's needs, raised in our own Southern states. In my judgment, the South will make a grave mistake if, by wilful reduction of acreage, it fails to grasp its opportunity to provide the world with a sufficient supply of cotton, at a reasonable price. Efforts are being made by Great Britain, France, Germany, Russia, Italy and Belgium to extend the cultivation of cotton in West, Central and East Africa, Asia Minor, the British West Indies, and other countries. The Secretary of the British Cotton-Growing Association recently said: "The greater part of the British Empire lies within the cotton belt, and as the result of investigation and experiment, it is believed that within the British Empire all the cotton required can be grown. As Britishers we have put our hand to this work, and no pains will be spared to make it a success." So far, the results in these new fields are of the most meagre kind, but Anglo-Saxon energy and perseverance may ultimately develop formidable rivalry to the Southern States. An English paper in reporting on the recent Exhibition in London of British-grown cotton, says:

"The experimental work in the West Indies, facilitated by the circumstance that the cotton cultivation is not new to these islands, already gives promise that they will be able to supply the English market with fine cotton. Cotton growing, indeed, is extending rapidly, the area under cultivation during the season 1904-5, being estimated at 14,000 acres, as compared with 4,000 acres in 1903 and 400 acres in 1902. Soil, climate and labor conditions are favorable, and the industry is now established on a commercial basis."

It cannot be good business judgment to encourage competition by the unsound economic policy of reducing the production of a great staple that the world needs, in order to obtain an exorbitant profit. The scheme to market the cotton crop throughout the year at a steady price is an excellent one, and we hope it can be carried out. As

Americans we rejoice in the prosperity of the South, and realize that with the practical monopoly in cotton growing which it enjoys, there should be an ample profit in the business. Every cent a pound on a 10,000,000 bale crop means $50,000,000 increased wealth and purchasing power, and of this, $30.000,000 comes from abroad. It should, however, be remembered that a large part of the export trade in cotton goods is with poor countries, and that high prices will necessarily limit consumption.

There is another form of competition that may come up. If cotton can be grown at from 5 cents to 6 cents per pound, and by curtailment of production the price is to be maintained at 10 cents to 11 cents, there is every inducement for large manufacturers to combine together and grow their own cotton. They would in this way get their raw material at cost price, and, in addition, save themselves from the anxiety and possible loss incidental to its purchase. A mill of 200,000 spindles using 25,000 bales of cotton per annum, by growing its own cotton at a cost of 5 cents per pound less than the market price, would effect a saving of $625,000, or over $3 per spindle, which would pay 20 per cent. annually on the cost of an American mill, and 30 per cent. on the cost of a European mill. This is a much better business than manufacturing. Intelligent, business-like methods applied to cotton growing on a large scale would in all probability reduce the cost to 4 cents per pound. The available land has been estimated at as high as 150,000,000 acres, but if it is only 50,000,000, there is ample good cotton land to be gotten for the requirements of the near future. It would pay European spinners much better to grow their cotton in this country than to develop cotton growing in Africa and elsewhere.

The Southern Cotton-Growers' Association has done excellent work in exposing the dishonesty of officials in the Bureau of Statistics of the Agricultural Department. Estimates of the acreage or condition issued by the Government should surpass all private reports in accuracy and reliability, and employes engaged in this work should be both capable and honest. It is to be hoped that the reorganization of this branch of the Government service will be thorough. It should include not only the method of summarizing the figures in Washington, but the whole system of getting information from the cotton-growing districts. If the Government reports can be relied upon, they will be of value in restraining speculation, which has lately been so disastrous to our trade.

Speculation in cotton futures by parties who have no interest in cotton growing or manufacturing, is generally felt by manufacturers to be injurious. In recent years it has become a more exact science than ever before. In a recent circular Mr. Price said: "The opportunity of the speculator is in the probability of radical changes of value." The seesawing of the market is exactly what is hurtful to the manufacturer. Buyers lose confidence in the stability of values, and cotton goods get out of harmony with the raw staple. Manufacturers have not the superhuman wisdom required to buy always at the right time, and in consequence they are subject to heavy losses on cotton bought at too high prices. The other great textile raw materials, wool, silk, and linen are almost entirely free from this system, with the result that the fluctuations are less violent, and prices are more solidly based on legitimate supply and demand. It is remarkable that a huge system of speculative trading can be carried on, which is contrary to the law of nearly every State in the Union, which works incalculable injury to a great industry, and which has drawn into the vortex of gambling, thousands if not millions of men throughout the country. Is there no remedy?

It is not my intention to enter into any extended discussion of the present agitation for tariff revision or reciprocity. It is worthy of note that there are few advocates nowadays of any radical change in the present economic system. All the world over, even in England, there is a growing belief in the necessity for some measure of protection. In the midst of unprecedented prosperity, with capital reaching out to new enterprises on every hand, labor fully employed, and exports and imports both increasing rapidly, it is surely an inopportune time to agitate a question that invariably breeds distrust and uncertainty.

It is premature and unnecessary to get alarmed about the loss of German trade because of their new tariff. From all accounts, German manufacturers and merchants are much disturbed as to the results of their new tariff, which they see clearly has been promoted in the interests of the agricultural classes. They realize that the United States will not submit to be put on a most-favored nation basis than competing countries, and at the same time, continue the most-favored nation treatment to Germany. We can surely trust President Roosevelt and Congress to protect our commercial interests and secure from Germany the same equitable treatment that we accord it.

Our industry deserves and will undoubtedly receive just and considerate treatment under any tariff revision of the future. It is the largest industry that is practically free from combinations. It does not extort high prices from the consumer under the shelter of a protective tariff; on the contrary, it is continually struggling by improved machinery to reduce the cost of its products, and under full and free competition any exorbitant profit is impossible. It has had to meet perhaps the most highly developed industry of England, and in competition therewith it is gradually getting into a position to export larger quantities and a greater variety of fabrics.

Gentlemen, I congratulate you on the improved and satisfactory outlook for business. I trust that our sessions will be interesting and profitable, and that you will return home with the stimulus of many new ideas, determined to "make hay while the sun shines"; and also to maintain your mills in the highest state of efficiency, so that when the rainy day of depression comes you may be able to meet any competition, and while retaining the domestic market, also reach out across the seas and secure a continually increasing share of the world's trade in cotton manufactures.

President MacColl was listened to with close attention and his practical suggestions made a deep impression on his hearers. It was peculiarly appropriate that his remarks about the community of interests between

planter and manufacturer should be emphasized by having his address followed by a paper entitled:—

THE COTTON PLANTER.

RICHARD CHEATHAM, Secretary Southern Cotton Association, Atlanta, Ga.

A better understanding and a more cordial trade relation between the manufacturers and growers of cotton would quickly solve many of the difficult problems which confront us now and have for many years have seriously affected the interests of both producers and spinners.

The policy of the Southern Cotton Association, which I have the honor to represent in part before your distinguished body, has been since its inception at the great New Orleans Convention last January to cultivate friendship and better trade relations with the manufacturers of our great staple crop. To that end the association has appointed a committee from among its most intelligent and competent members to confer with you at such time as may be convenient to appoint a similar representative committee from your body to take under consideration such matters as vitally affect the interests of both. I feel that much lasting good will result from such a conference and hope that the time will soon come when the producers and handlers of the South's great staple may control both the price of the raw material and the finished fabric profitably to both and unhampered by the evil and devastating influences of speculation and intermeddling of outside interests.

The cotton planter of the South is at last beginning to enjoy the freedom from the domination of the speculator and manipulator of the price of his great staple crop. For half a century Southern cotton producers have bent their energies and devoted their abilities almost entirely to production. They have now fully solved the problem of production and recognize their power to continue a monopoly of the world's cotton production against competition from any and all other sources of supply. Having solved this problem, they are now turning their attention to another equally if not more important feature of their vocation, that of studying and becoming important factors in the markets where they offer for sale the products of their labor. The fair prices which they have received for the cotton crops during the past four years have strengthened the financial position of the cotton planters and they are now no longer occupying a position of dependence and subserviency to prices fixed by the speculation exchanges of the country. A new era has dawned for the South and her financial strength is now known and recognized in all of the great money centres of the world.

Southern cotton planters are, as a mass, conservative and fair in their dealings with all whom they meet in the highways of trade and commerce. It will at all times be their mission, under the guidance of their leaders, to build up all legitimate classes of industrial activities affected by the products raised on their farms.

All that they now, or will ever demand, is an equitable and fair division of the profits arising from the sources of wealth they create. They regard the spinners of the world as joint partners with them in the handling of their great staple from the field to the consumer. They want to see the manufacturers of their raw product prosper and progress each year, declaring fair dividends to the stockholders on the capital invested. They will never exercise whatever power they may possess to strike down or injure the manufacturing interests of the country. At the same time, however, the cotton planters of the South will insist upon and enforce their demands for a fair profit above the cost of production in the future sale of their staple. They will insist upon a stable price for cotton which is fair to both the spinner and the producer. They will build warehouses at all interior points where their cotton can be stored and protected and learn to market each crop slowly so as to regulate supplies to meet the legitimate demands of the manufacturers and break up the past bad methods of rushing enormous over supplies on the markets during short periods of time, thereby placing both the spinners and the producers in the hands of the modern speculators.

Southern cotton planters are now being educated to take better care of the staple and to send their cotton to the spinners in better condition.

In the efforts of the Southern Cotton Association and its hundreds of thousands of members and loyal supporters throughout the South, to carry forward successfully the great work undertaken as outlined above, the active co-operation of the spinners is earnestly desired. We want to bridge the chasm which has so long existed between the spinners and producers by inducing a meeting upon half way ground where we will welcome you in a spirit of fair dealing. You should encourage a slow movement of the crop on the markets of the country and the building of safe and commodious warehouses where the staple could be stored at a minimum rate of cost and where it could be fully protected from the weather and kept in good condition for the spindle and the loom. You should encourage the establishment of a stable price devoid of the fluctuations which have figured in the markets so disastrously to your interests and that of the producers during the past eighteen months.

With your co-operation and the weight of your powerful influence much more rapid progress could be made and the spinners and the producers could much more quickly join hands in the great march of progress in the future. The farmers of the 20th century are quite different individuals from those who tilled the soil three decades ago. The rural free delivery, the telephone system, good roads and better schools are educating the people of the rural districts as never before and rapidly preparing them to fight the battles inaugurated by such intense competition in all lines of business, and the great desire to make money the crowning monarch of the world.

A revolution in the system of marketing crops is here on the threshold of the 20th century to stay and to gather strength each year as time rolls on. Intelligence will be the guide and an educated husbandry will soon become one of the most powerful factors with which the business world must soon learn to reckon. Let all men strive to succeed in those things that tend to build up humanity and human endeavors where righteousness

and justice hold the scales evenly balanced. Let us strive to win in the battle of life on lines of equity and fair dealing, giving to each and every man that right of consideration which he deserves. He who creates wealth makes wealth possible to others. The producers of the great American staple who make the great spinning industry of the world possible, thereby giving employment to hundreds of thousands and furnishing clothing to millions are factors which deserve and should receive the direct consideration of the whole civilized world. That this unity of direct business dealings may soon be realized is a matter to which I invite your serious consideration.

OUR PRODUCTION OF FINE COTTONS.

FRANK P. BENNETT, Jr., 31 Nassau St., New York City.

The New York papers published the other day with a good deal of gusto, the letter of the American consul at Dublin to his home office announcing that British textile trade conditions were the subject of grave concern to her manufacturers, and that the importance of Great Britain in textiles was passing away. To those of us who had been compelled by the very nature of our business to keep a close eye on English trade conditions, this letter was altogether surprising. It was rightly a matter of great pride to our commission houses and manufacturers, that in the eleven months, ending with May, 1905, our exports of cotton cloths had been increased some 395 million yards, but England, in only five months, ending at the same time, had increased her cotton goods exports almost 317 million yards, or well nigh as much, and the British total for the five months of 2,502,000,000 yards, was over four times the amount of export business we had done in eleven months. Moreover, their mill construction, which is a good barometer of the manufacturers' expectations for the future, even if not of existing conditions, was far in excess of ours. Plainly such conditions were not indicative of a decadent industry.

My correspondence with the consul in question at once laid bare the situation. His report was merely a transmission of the findings of the Protective Tariff Commission which Joseph Chamberlain had set at work and they alone were responsible for the figures. I shall not take this occasion to suggest that in America we do not ordinarily regard the figures advanced in a tariff argument as safe for use without bringing other facts to bear on them. Neither will I undertake to prove, though no task would be easier, how completely the argument of the Commission can be met by use of its own figures if a different and equally sound point of view is assumed at the outset. My purpose in referring to this incident is twofold: to note with what discomposure our successes in cotton manufacturing are viewed abroad and, more particularly, to show, from British example, what it means for a nation to undertake the task of running a weave shop for the world.

The facts that the British Tariff Commission deduced were these:

Great Britain today consumes no more cotton than it did fifteen years ago. At that time British mills consumed two million hundred weight more cotton than the continent, but now use eight million hundred weight less than they. The United States, which used to use 500 million pounds less than Great Britain, now uses 300 million more than the British. Most galling of all was the fact that the British cotton goods exports to the Continent have dropped to 280 million yards per year, although they used to be 400 million yards.

This is not the place to show how fatuous must be any argument for a protective tariff based upon figures like those, but it clearly is not out of place to suggest that the story which the commissioners do not tell is far more valuable to us than the one which they do. Their own figures prove that Great Britain, wedded by necessity to a large export business, has never failed to be equal to any emergency. Once her mills were virtually unopposed, save in local conditions, in their attempt to supply the globe with cottons, and under these monopoly conditions their consumption of raw cotton and their production of goods became enormous. Then came the time of competition when the Continent and America both began to build mills and to strive to win their own home markets. In a measure they have succeeded, and England's exports to both continents fell off. But, on the Commission's own showing, the Continent still needs 250 million yards of British cottons in order to clothe itself and the United States last year brought over 35 million yards of cloths and over $9,000,000 worth of other cotton manufacturers from the United Kingdom. In the face of this foreign activity, neither has the volume of British cotton goods exports diminished, nor has her cotton textile industry failed to maintain its production at the place which it had reached in the old days when it had the world's field to itself. They found new markets just as fast as competitors drove them from the old ones where nature had given these new competitors a fairer show. The sales which our country has made in China were won by wresting a portion of the coarse goods market from Great Britain, but their mills were alert enough to gain the fine goods market when they were forced from the coarse. What impartial observer can say that the country which finds its volume of business unimpaired after fifteen years of lively competition and has made its mills efficient enough and its system of selling alert enough to replace any losses by gains in a new quarter is not the stronger rather than decadent for the experience through which it has gone? And such, I believe, is the verdict the rest of the world puts on England's present manufacturing condition, for not long ago I heard a mill president, who has been very successful in fine cotton manufacturing, say that before he erected the new mill he had in mind he wanted his superintendent to visit England because there they had adopted methods that our people needed to copy.

I have devoted this much space to the report of the English commission for the two reasons already noted, namely, that our great advance in cotton consumption is admitted by a competent foreign commission to have been most remarkable even in the last fifteen years, and that I might show what a problem it is that a country undertakes when it constructs mills until their capacity exceeds the home demand. With us, this finding is peculiarly true. In the home market, not only is prejudice but every other condition peculiarly in our favor. Material is handy, freight not an im-

portant factor, and most of the competition from abroad put distinctly at a disadvantage by tariff protection. Once embarked on a world commerce our mills must meet factors hitherto undreamed of and competition with the wits and methods of other peoples that will tax the best that is in us. Great Britain met all these and succeeded. How? By a willingness and an ability not only to meet the rest of the world but, and here is the real point, to change her methods and even her product just as conditions required it.

That is the task our rapid construction of mills has brought upon us. In the last three years and a half, according to figures fairly accurate which have passed through my hands, four hundred and eighty-three new cotton mills have been begun in this country. No less than four hundred and five of these were south of Mason and Dixon's line and hence, more than likely to be devoted to the manufacture of brown cottons, denims, and like goods. As a result, a market had to be found abroad or our mills must turn to cutting each other's throats. The first alternative prevailed and the value of the cotton manufactures which went forth from this country and were worth but four million dollars in 1875, and in 1895 had grown but to 13 3/4 million had become with the fiscal year ending June last worth 49 2/3 million dollars and the orders for more goods have come in in such volume that two-thirds of our Southern mills and a great number of our Northern mills are sold up well into next year for foreign delivery. That this trade has become essential to our textile prosperity no better evidence is needed than the genuine alarm we have heard from textile centres lest the boycott in China should prove lastingly effective and the goods of the mills now employed for China delivery be let loose on our market. If more evidence were wanting, it would be found in the glutted market for cotton goods every time the foreign demand is withdrawn and in the fact that now one rarely hears Northern mill owners dreading Southern competition. The United States is unalterably committed to world trade on coarse cottons, with all the difficulties and perplexities which the experience of England just quoted proves that trade to entail.

The study here reported was due directly to certain talks which I had with large cotton commission houses in New York during the summer now past. It was inevitable that the first topic of conversation should always be the wonderful success our mills had met in dealings with China and the most unusual way in which they had been sold up well into 1906. Equally inevitably, the fine goods houses were led to compare this condition with their own sales and I found the question raised in quarters where an opinion is worth considering, whether there had not been too much changing over from coarse to fine, too much erection of new fine goods mills.

The query at once opened a fertile field for speculation, but, unfortunately, not one in which absolute knowledge was readily available. Obviously, the only way in which one knows beyond a doubt whether we have too many cotton mills in this country running to the finer counts of yarn and the goods made therefrom would be by a record of what the aggregate production of all these mills has been year by year, over against which must be set an average of the total sales of the same goods for a period of years. Each of these records is beyond human reach. It is fortunate, however, that we can approximate the truth in other ways.

Now I think it will be admitted that short of an actual examination of a mill's books, the real test of its prosperity is the regularity with which it is operated. I know this method is open to question and that mills have been known to run at a loss rather than to lose the organization or the market they had acquired, while on the other hand really profitable mills have had their dull seasons when others, less profitable, were running very busily. Fashion is fickle and may change from colored to white goods, from or to stripes, and away from or toward jacquards, just as has recently proved the case when mills equipped with this class of looms have suddenly found themselves all too small for their orders where a month or two before they had found business as flat as a pancake. Equally fickle is the trade which, in 1903, taxed mills making fine fancy ginghams to their utmost and then proceeded in the following season to neglect utterly this class of goods for the sheerer fabrics. But, taking the industry by and large, any great curtailment of production or any widespread idleness of employes or machinery, can be proof of but one condition, and that is, of a market which does not need so many machines to supply its wants. Clearly that is not the condition at the present time nor have the fine cotton mills had to experience that state save in the periods of general depression when everything is upset. On the contrary it is their average of success which has caused mills to change to fine counts.

I have promised to bring to the support of this evidence certain commercial figures. Part of them I have already quoted when I showed how largely cotton mill construction in the last three years and a half had been limited to the South, a distinctly coarse goods section, only 78 out of 483 new cotton manufacturing enterprises being undertaken north of Mason and Dixon's line. A careful examination of the latest textile directories shows that out of the new cotton mills added since their previous editions something like five or six may properly be called fine cotton goods plants, and the balance make either brown cottons, denims, ducks, osnaburgs or miscellaneous coarse stuff like nets and twines.

But a most potent source of confirmatory evidence is the material relative to our exports and imports which the government is all the time publishing. Unfortunately it lacks in detail, and the several hours which I have spent in the Custom House in New York have failed to convince me in what lines the changes in volume were occurring. The imports of cottons have, nevertheless, shown in the last two or three years a most encouraging decline. In 1900 we imported over three million square yards of cottons that had not been bleached, printed or colored in any way, and almost sixty-two million square yards which had been treated in some way to a finishing process, making a total of sixty-five million square yards. That figure, the largest in a decade, has never since been reached, the highest subsequent point occurring for the year ending June 30, 1903, when the amount was about sixty-one million square yards. This decreased

in the following year to fifty-one million, and in the fiscal year just closed, to forty-seven million. The conclusion seems unavoidable that our mills are cutting into the import cotton business in a most satisfactory way, and yet an equally inevitable conclusion is that when a country has to find forty-seven million yards of cotton goods abroad, which represent a value of almost eight million dollars, it cannot be said that the mills of that country are producing too much for the home consumption, or even that they are adequate to the home demand. I don't want to deny the very satisfactory inroads which certain specific lines of ours have made into the business which famous English lines used to have here. I know for example that the American outlet of the Andersons' has been won away from them by mills represented here today, and buyers of our large department stores who used to go abroad for wash goods have found it no longer profitable to do so. They are able to supply their wants on this side. But the same study of our cotton goods imports shows that the decrease to the present volume still finds us buying vastly more than we did in the years prior to 1899, and almost twice what we bought abroad in 1894, when many of today's necessities were made to look like luxuries by the hard times. In short, there is still a large field for more American mills that are not confined to brown and coarse goods.

Nevertheless, it is a fact that the fine cotton mills are approaching each year more nearly to the point of necessity for exports. There are certain mills which produce the higher value of goods which have made more sales abroad in the last three months than ever before in their history. I am told by these people that this is due to the peculiar conditions of that portion of the American market which they supply. The buyers' fancy has for the moment turned away from their goods here at home and necessity has compelled them to find an outlet for surplus product elsewhere. When home demand once more turns back to their lines they are less likely to take advantage of any foreign opportunity. Clearly though, when popular fancy turns to their goods again it must leave those of some other mills, and they in turn become, perhaps ought to become, interested in chances abroad.

At the Wednesday evening session the report of Samuel S. Dale, editor of the Textile World Record, on the International Cotton Congress at Manchester, England, last June, who represented the New England Association on that occasion, was read, as follows:—

INTERNATIONAL CONGRESS OF COTTON SPINNERS' AND MANUFACTURERS' ASSOCIATIONS.

BY SAMUEL S. DALE, Editor Textile World Record.

The temporary scarcity of American cotton last year which gave speculators an opportunity of cornering what little poor cotton was left on the market, sending the price of middling uplands to 17 cents, led the cotton manufacturers of Europe to form an organization for mutual protection against the continuance or recurrence of the shortage. The European organization formed in this crisis held its first meeting at Zurich in May, 1904. While short time for the next four months in European mills was a matter of necessity, the Zurich Congress undoubtedly contributed to its more general adoption. The organization has since been made permanent under the name of the International Federation of Master Cotton Spinners' and Manufacturers' Associations. A constitution and by-laws were adopted by the international committee at Brussels last April when a call was issued for a meeting of the Congress at Manchester, England, the following June. The secretary of your association, Mr. Woodbury, learning that I expected to be in Ireland at that time, suggested that I attend the Manchester meeting and make a report of the visit at the fall meeting of the New England Cotton Manufacturers' Association.

WELCOME TO AMERICA.

Upon my arrival in Manchester Town Hall during a session of the Congress, I received a most enthusiastic and friendly welcome as the first American representative at the International Cotton Congress. About ninety delegates were in attendance. representing, with the exception of Russia, every important manufacturing country of Europe. The proceedings of the Congress were secret. With the exception of some printed papers on technical subjects, only the most meagre accounts of the sessions were given to the press. Soon after my arrival the president of the Congress cautioned me against giving out anything for publication, but he requested that I make a report of the Congress to my people in America, and today is the first time I have felt at liberty to speak freely of the International Cotton Congress at Manchester.

OBJECT OF THE CONGRESS.

The objects and character of the organization are indicated by the following extracts from its constitution and rules:

1. The purpose of this International Federation shall be to watch over and protect the common interests of the Industry, and to advise Associations of the action to be taken against any common danger.

2. The means to be employed are:—

(1) The holding of Congresses of Delegates from the Associations in all countries becoming affiliated with the International Federation.

(2) The appointment of a Committee of Management who shall:

(a) Control the work and expend the moneys of the Federation under the instruction of the Congress.

(b) Distribute information of practical value in carrying on and improving the conditions of the Cotton Trade.

(c) Assist in the formation, strengthening and assimilating of Associations in all Spinning and Manufacturing Centres of the Cotton Industry.

(d) Call together the Delegates to special Congresses when the need shall arise.

(e) Consult the Association by correspondence, and distribute and collect voting papers from the Associations on any international movement in connection with the trade.

(f) Take any other action in the common interest of the Trade that may be decided upon by the Congress.

6. Each Association joining the Federation shall pay an entrance fee of 2/100 of a penny per Spindle and 1/2 pence per Loom (one Loom to be equal to 25 Spindles.) This Entrance Fee shall include the first year's levy.

7. For the year 1905, and each succeeding year until otherwise determined, a levy shall be made of 1/100 of a penny per Spindle, and 1/4 pence per Loom. Associations are liable for the coming year's levy unless they have handed in their resignation at least three months before the end of the current year. Resignation forfeits all right to any accumulated funds.

10. The offices of the Federation shall be in Manchester. Any change in the headquarters must be by decision of the Annual Congress.

The main purpose of the international organization is to prevent a scarcity of raw cotton. This of course can be accomplished in only two ways, by using less or by producing more. The first method, which means short time, although the one on which the delegates unquestionably placed their main reliance was conspicuous by its absence from the program and was not made prominent in the discussions. There was, however, no mistaking the spirit of the Congress. The members were united and they were in deadly earnest in their determination to meet high prices for American cotton with organized short time. It was recognized that this is the one desperate remedy that the spinner has always ready, that its efficiency depends not upon talk, but on thorough organization and prompt action, and that a discussion of a method to be used only in time of scarcity could do no good and might do much harm in June, 1905, when there was plenty of cotton for all.

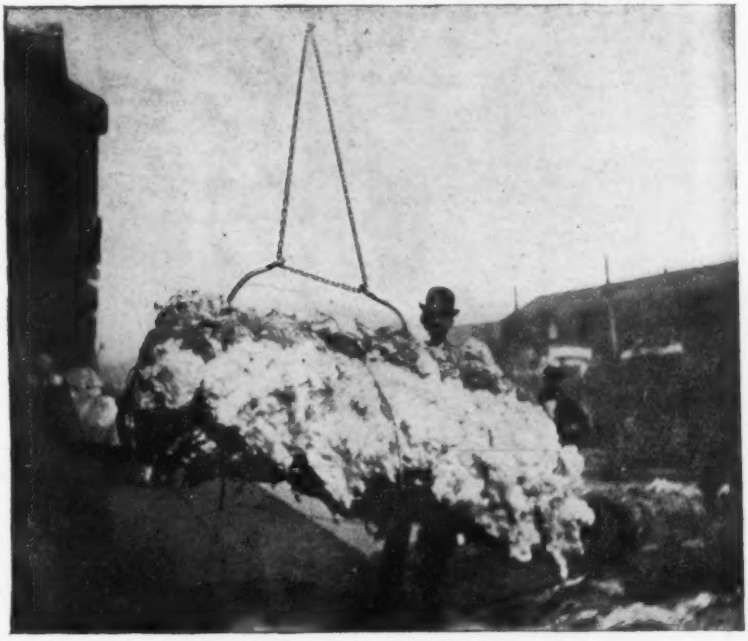
THE RIGHT WAY AND THE PRESENT AMERICAN WAY.

COLONIAL COTTON.

The discussion of the second method of preventing a scarcity, by increasing the supply, was left to the closing hours of the last session on Friday and consisted of reports by representatives of Great Britain, France and Portugal on the growing of

cotton in the colonies of Europe. No report was made on cotton growing in Togo, a noteworthy omission in view of the systematic efforts that Germany has been making for several years to establish the industry in that colony.

Whenever colonial cotton was mentioned among the delegates or the people outside the Congress, it brought out enthusiastic expressions of approval. Invariably, however, their words had a certain vague, far-away character, as if they were based on hope rather than on knowledge. At Friday's discussion the speakers were manifestly desirous of presenting colonial cotton growing in the best possible light, but they made it clear that the natural obstacles in the way of making cotton grow in the colonies are very great and possibly insurmountable; that the enterprise is supported by government subsidies and private contributions; that its precarious existence depends on a continuance of the subventions by which it has been established; and that in view of the natural increase in the demand for cotton, estimated by J. A. Hutton of the British Cotton Growing Association at 400,000 bales a year or 4,000,000 bales every decade, the cotton product from the colonies is likely to remain a negligible factor. Nevertheless, the reports were tinged with the rosy hue of a hope that colonial cotton would some day liberate the cotton mills of Europe from their present dependence on the American crop.



UNLOADING AMERICAN COTTON AT MANCHESTER, ENGLAND.

SLOVENLY AMERICAN METHODS.

At one session of the Congress the baling of cotton came up for discussion and bitter complaints were made of the way in which American cotton is received in Europe. In this Congress, which represented purchasers of American cotton to the value of $350,000,000 per year, there was not a man who could say one word in favor of American baling. The baling of cotton from India and Egypt was entirely satisfactory, but the English, French and German vocabularies were ransacked in vain for words strong enough to denounce the American bale. Several members spoke of the large number of no-mark bales and of the fact that a large proportion of such bales were of the poorer grades of cotton, and intimated that the marks were purposely obliterated to cheat the European buyer by having the lower grades of no-mark cotton divided pro rata among the consignees of the cargoes. Later in the week the Manchester Ship Canal Company placed a launch at my disposal to visit the canal and docks, and I then had a good opportunity to see the condition of the cotton as it was received there. I was glad then that I missed Monday's excursion of the Congress over the canal, as it saved me the mortification of standing among the representatives from all parts of Europe and looking at American cotton bales landed on the Manchester docks. The marks on most of the American bales looked as if some one had dipped both hands in a pail of red paint and then wiped them on the bagging. The superintendent said the splashes were letters and numbers, and proudly brought forward the man who could read them. He is a wonder. He read two or three of the daubs for us to prove his ability. He has to give it up many times, however, when he can't find any paint. I don't know what they would do if this man should leave them. You can see him in the background of one of the pictures I took at the time.

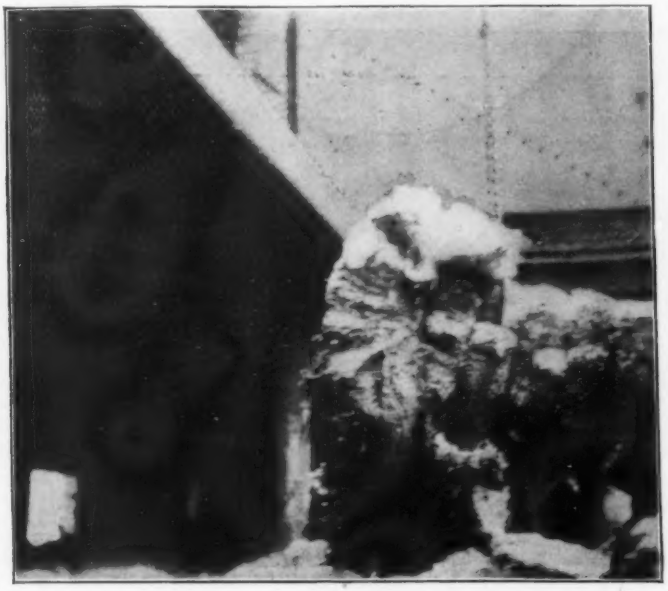
Few bales were intact They varied from one tie

off to none on. Bales of all sizes, ragged and dirty, the fleecy staple bulging out and scattered in all directions. In most cases the bale was partially wrapped in half a dozen kinds of bagging, much of which apparently had been used many times before. In few cases did the bagging completely cover the cotton.

A ROYAL PLANT.

The losses by such methods are borne by every one that handles American cotton, from the grower to the spinner. They entail extra charges for freight, insurance, storage, handling, re-weighing, picking and mending, besides the damage to the staple and loss of cotton. Every cargo has a large amount of loose dirty cotton to be divided among the consignees. The collecting of American cotton in the streets around the Liverpool docks is a regular occupation, by which a considerable number of people gain a comfortable livelihood. Looking at these American bales one cannot wonder that the European thinks American cotton is not worth more than eight cents a pound. The cotton itself is the best of its kind in the world. An eloquent Southern orator thus described it:

"What a royal plant it is! The world waits in attendance on its growth. The shower that falls whispering on its leaves is heard around the earth. The sun that shines on it is tempered by the prayers of all people. The frost that chills it, and the dew that descends from the stars is noted, and the trespass of a little green worm on its leaf is more to England that the advance of the Russian army on her Asian outposts. It is gold from the instant it puts forth its tiny shoot. Its fibre is current in every bank, and when loosing its fleeces to the sun it floats a sunny banner that glorifies the field of the humble farmer; that man is marshaled under a flag that will compel the allegiance of the world, and wring a subsidy from every nation on earth. It is the heritage that God gave to this people forever as their own, when He arched our skies, established our mountains, girt us about with the ocean, loosed the breezes, tempered the sunshine, and measured the rain. Ours and our children's forever. As princely a talent as ever came from His hand to mortal stewardship."



AMERICAN COTTON AS RECEIVED AT MANCHESTER.

To make this truthful picture complete, it must be added that the cotton crop thus confided by the Almighty to American stewardship is baled in a way that would disgrace a Hottentot.

GAMBLING IN COTTON FUTURES.

In addition to bad baling, the Congress discussed speculation in cotton futures, which is a cause of even greater losses to the cotton manufacturer. In the case of bad baling, the manufacturer is an innocent sufferer and is forced to bear the shameful waste resulting from the slovenliness and neglect of others over whom he has no control. The losses from the fluctuations caused by speculators are, on the contrary, due to a system of trading practiced extensively by the manufacturers themselves. It was stated at Manchester without contradiction that the manufacturers were active and habitual dealers in cotton futures, and one of the German delegates told of a recent operation in futures where he had made a handsome profit for his stockholders, and added "I would have been a fool not to do it."

During the discussion attempts were made to distinguish legitimate from illegitimate speculation, the general opinion being that the farther the speculator is removed from the cotton mill the more illegitimate does his speculation become. The force of all their denunciations of the serious evils of speculation was greatly weakened by the admission that they were complaining of a system which they had approved by adopting it in practice. This admission pointed to the only certain remedy, the drastic suppression of dealings in cotton futures as at present carried on, bringing the Liverpool, New York and other gambling cotton exchanges to the business-like, common sense standard of the Royal Manchester Exchange.

FIGHTING FIRE WITH FIRE.

If the evils were confined only to those who speculate, there would be less objection to it, but manufacturers who carefully avoid speculation on the cotton exchanges are frequently the greatest sufferers from its effects. One speaker, Herr Kuffler, of Austria, illustrated the ideal condition of speculation by describing the pools on the daily run of a steamer that once carried him across the Atlantic. When the official figures were posted at noon, the money paid by those who made the poorest guesses was turned over to those who had made the best, while the others on board who had not bet on the run neither won nor lost anything. That, in Herr Kuffler's opinion, was legitimate speculation. Only those in the pool stood to lose or win. "In cotton speculation," he continued, "it is entirely different, and what I object to is that I should lose because somebody else plays the game." This idea met with emphatic approval, but unfortunately Herr Kuffler omitted to state how the ideal conditions of speculation on the daily run of a transatlantic steamer could be duplicated on the cotton exchanges of New Orleans, New York and Liverpool. In fact, with what was either a strange inconsistency or a frank admission of the impossibility of attaining the ideal, Herr Kuffler brought forward as a remedy for the evils of speculation a radical plan to form a gigantic speculative pool, to include all the cotton manufacturers of the world, in order to combat the non-manufacturing speculator. He outlined this plan as follows:

"My idea is that it is necessary to form a buying agency that buys like any other big cotton firm. I assume that for every 10,000 spindles you run—I take medium counts—you use 2,000 bales a year. All I ask is that you take 100 or 150 bales a year from this association which I suggest you form. That is not a great risk. Take it at the average cost price to this company. If I have a sure call for this cotton, then I do not want to hedge. I do not want any dealing in futures. We have been told there are more than one hundred million spindles in the world. Then it is 10,000 times 10,000. That means that if for every 10,000 spindles you take 100 bales, we can handle a million bales of cotton and no risk with it. All the risk you would incur would be to get 100 bales perhaps a little dearer than the lowest price, because it is an average buying price, and this association, run entirely by spinners, has a million bales in hand. Do you think it will take a million bales of actual cotton to break any corner? I think with a quarter of a million bales you can break any corner. I do not speak only of speculations to put prices up. Sometimes we have lost by speculation to bring prices down, and one was not more legitimate than the other. If we have the power to buy cotton at the rate of 100 bales per 10,000 spindles, we can buy when prices go down, and, if necessary, in the opinion of your committee, the bales can be thrown on the market when prices go up. With the least possible risk that would give you an influence on the market which you do not now possess."

MISPLACED CONFIDENCE.

Besides this plan, which is chiefly interesting as showing the unlimited power with which it was proposed to clothe the Committee of Management, the discussion included a proposal to form a bureau for collecting statistics of the consumption of cotton and the visible and invisible stocks on hand. It was the general opinion of the Manchester Congress that the statistics of the United States Government regarding supply, acreage and condition of growing crops were all that could be desired. If now, they argued, we determine the truth about the stock and the consumption at the mills, we will know just what the price should be, and the manipulators of the cotton market will be deprived of their sole support, which is false statements regarding supply and demand that no one can deny with authority. This was in June, 1905, a few weeks before it was discovered that the cotton speculator had camped in the United States Department of Agriculture. That fact is useful as showing the necessity of guarding against a similar lodgment in the proposed International Bureau of Cotton Statistics.

THE METRIC FALLACY.

Thursday's session, held in the Liverpool Town Hall, was devoted to the discussion of the metric system. The English delegates were unanimously and strongly opposed to the metric system of weights and measures, while the Continental delegates were enthusiastically and almost unanimously in favor of it. Herr C. O. Langen, President of the Verband Rheinisch-Westphalischer Baumwollspinner, formed one notable exception among the Continental delegates. He represented an important association of German spinners which during the last three years has strenuously and successfully opposed the adoption of the metric system in the German cotton industry. Largely as the result of action taken by his association, the cotton yarn schedule of the new German tariff which goes into effect next March, is based, as in the past, on the English system of weights and measures.

Papers in favor of the metric system were read by Kommerzienrat Ferd. Gross, of the Kolonial-Wirtschaftliches Komitee, Berlin, and by Ferd. Roy, of the Syndicat Normand du Tissage de

Coton, Paris; in opposition, by J. R. Byrom and Thomas Roberts of Lancashire and myself. The metric position was greatly weakened by several undisputed facts:

First, the almost universal use of the English system for the cotton industry.

Second, the fact that at the present time, over a century after the foundation of the metric system, the weights and measures of the Continental textile industry, including that of France, are in a state of chaos, due to the mixture of old and metric standards which makes direct calculations impossible and renders it extremely difficult for Continental manufacturers even to understand each other when discussing textile matters.

Third, the practical uniformity of weights and measures in English-speaking countries.

Fourth, the fact that the metric system is now permissive in Great Britain and the United States, and that any one can use it in these countries if he wants to.

The Congress took no action beyond a discussion of the question, but the spokesman of the Continental representatives stated that the agitation in favor of the metric system would be continued with undiminished energy.

ENGLISH HOSPITALITY.

Such is a brief outline of the International Cotton Congress at Manchester. One benefit that resulted from this Congress was the acquaintance formed with each other by the delegates from the different countries. You who in this respect have experienced for so many years the good results of the regular meetings of the New England Cotton Manufacturers' Association, can readily appreciate the even greater benefit from bringing together the representatives of different countries ordinarily separated by differences in language, race and political institutions, as well as by distance. The delegates to the Congress received a hearty welcome and during their stay were entertained most hospitably. There were receptions, luncheons, banquets and excursions, given by the Manchester Ship Canal Company, the Manchester Cotton Association, the Lord Mayor and Corporation of Manchester, The Royal Manchester Exchange, the Mayor and Corporation of Blackpool, the Lord Mayor of Liverpool, the Liverpool Cotton Association, the Mayor and Corporation of Southport, and by the English Federation of Master Cotton Spinners Associations. The American representative received especial attention and courtesy wherever he went, and there was no mistaking the sincere desire on the part of all, whether from England or the Continent, to show their friendliness to America.

Under any circumstances the meeting of delegates representing the cotton industry of practically the whole world would be an important event, but the Congress at Manchester is of special interest to Americans by reason of its bearing on the cotton industry of this country.

It is easy to exaggerate the importance of an international congress, to enlarge upon the beneficial results of such a gathering, and to exalt it into a forerunner of the "parliament of man and the federation of the world," but unless its immediate objects are desirable and practicable, an international organization is far more likely to create dissension than to promote concord.

THE AMERICAN PERIL.

Before examining the main purpose of the International Cotton Congress, let us briefly consider one of the secondary objects of the organization, namely, increasing the supply of raw cotton. There is an error deeply planted in the European mind, that a serious danger lurks in the present extensive use of American cotton, and that Europe will derive more benefit from cotton grown in the colonies than from an equal amount grown in our Southern States. This error is easily explained. Although unable to produce the raw material, Europe, during the last century and a half, has directed her efforts toward the improvement of processes and machinery, the utilization of cheap labor and cheap power, the building and managing of mills, and the opening up of new markets for goods. During this time the production of cotton has kept well abreast of the world's requirements, and the European has grown to look upon the cargoes of cotton that come to his shores as upon the rain that falls from the clouds. Supplied from distant countries with raw material in sufficient quantity, he has made remarkable progress in converting it into cloth. He has displaced the spinning wheel with the modern ring frame and mule, and built up an industry which today comprises 85,000,000, or four-fifths of the world's cotton spindles, gives direct employment to a million and a half of operatives, and forms one of the chief supports of the industrial and social system of Europe. From this it is easy to understand the panic that seized not only the cotton manufacturers, but the rulers of Europe as well, when they woke up last year to a full realization of the fact that their great cotton industry was short of raw material and dependent on the United States for existence. The general fear was thus expressed by M. Berger, of France, at Zurich:

A VISION OF RUIN.

"Should the time come when America is in a position to use all the cotton she produces, then the state of affairs would be very different. The three hundred French spinning concerns and six hundred weaving establishments, without taking into account the dyeing and finishing works, would be obliged to close their doors, forcing on to the streets, deprived of their means of existence, a multitude of workers numbering more than 250,000, and thus causing a labor and economical crisis, the consequence of which would be disastrous."

The consternation produced by this prospect was increased by the knowledge that the only remedy available was short time, a temporary retirement from business, the forerunner of the ruin that M. Berger so vividly portrayed as the result of an American monopoly. The cotton supply suddenly became and still remains the subject of deepest solicitude on the part of all. The rulers and the public have seized blindly upon every plan for increasing the cotton supply outside the United States, and it is not surprising that under these conditions they have made the mistake of trying to raise cotton in Africa along the line of greatest resistance while neglecting the undeveloped resources of our Southern States.

FREE TRADE IN COTTON.

Reports of a little jag of cotton grown in some remote part of Africa are hailed with enthusiasm in Europe, while an increase in the cotton crop of America is but additional evidence of the peril of American supremacy. Apparently Europe has forgotten that free trade in American cotton is guaranteed forever by the greatest free trade document in existence, the Constitution of the United States, which forbids duties on exports. American cotton, like that of Asia or Africa, belongs to those who will pay the most for it. The price of Indian, Egyptian and American cotton fluctuates under the same influences in all parts of the world, and an increase in the cotton supply, no matter in what country, benefits Americans and Europeans alike.

Cotton cannot be raised in Europe, and to the European cotton spinner it makes no difference where he gets the supply of raw material, so long as he gets it. As well in Texas as in Togo; in Mississippi as in Madagascar; in South Carolina as in that Grave of the White Man, Sierra Leone. There being no advantage in colonial cotton as such, the question of increasing the supply is reduced to the simple problem of raising cotton where the required quality and quantity can be produced at the lowest cost. That locality is found in our Southern States. Nothing is easier than predicting a limit to the American cotton crop unless it is being wrong in such prediction. A year ago it was confidently asserted that the limit had been reached, but the Southern planter took off his coat, rolled up his sleeves and raised more cotton last season than was grown in the whole world seven years ago. Tempted by the high prices of last year and favored by the weather, the Southern farmer put forth a little more effort and not only relieved the scarcity, but fairly glutted the markets of the world with 14,000,000 bales.

Nor is such a crop a matter of surprise when the possibilities are considered. The cotton belt, with an area of 650,000 square miles, is nearly as large as France, Germany and Austria-Hungary combined, yet the area under cultivation is but half the size of Prussia.

There must be, of course, a limit even to the vast resources of the American cotton belt, and in view of the fact that the future increase in the world's requirements is practically unlimited, it may be worth while for far-seeing statesmen to encourage the extension of cotton raising in Asia and Africa where it is not now grown on a commercial scale, to build and subsidize railroads into the interior, to distribute free seed and farming tools to the natives, to hire experts to teach them how to cultivate the fibre, to guarantee a minimum price for the product, to introduce artificial irrigation, to install gins and presses, to subsidize steamships to carry the cotton to Europe, to spin, weave and finish the colonial raw material separately to determine its possibilities. This work, however, should be classed as an experiment for the benefit of a remote posterity, and as such the expense should be borne by the government. The efforts of manufacturers and of all engaged in the work of today should be directed toward producing cotton as they produce yarn and cloth, along the lines of least resistance, which in the case of cotton is found in the Southern States. Not until the possibilities of raising cotton here are exhausted, and the price has been raised sufficiently high, can cotton raising in less favored districts be commercially successful.

HELP WANTED.

I took occasion to express these opinions at the Manchester meeting and to call attention to what seemed to me to be the best method of increasing the cotton supply. The best authorities are agreed that the increase of the American cotton crop is merely a question of labor supply. The South is short of labor on the plantations, as well as in the mills. On the other hand, Europe, which needs more cotton, has such a surplus of labor that emigrants are leaving her shores for America at the rate of a million a year, but instead of going to the South, where they are needed, they land and remain in the North, where they are not needed. To get more cotton Europe has only to turn this stream of immigration to the South. These emigrants would assimilate with the white race in the South, and instead of creating new racial problems, as would be the case with Asiatics, their coming to the South would tend to settle the old ones. This plan was received with much favor at Manchester, especially by the Italian and Austrian delegates, whose countries supply at present a large part of the emigrants, and I have no doubt that efforts on this side of the water to divert this emigration to the South would receive effective support from all parts of Europe.

THE MAIN OBJECT.

The main object of the Congress is to regulate the price of cotton by getting common manufacturers throughout the world to restrict consumption in accordance with a prearranged plan. Such a plan necessitates an organization of the highest efficiency. Meetings of representatives of all manufacturing districts from all manufacturing countries must be held frequently and on short notice, while the most implicit obedience must be given to the orders of the Committee of Management. The mere statement of these requirements is enough to prove that these plans could never be carried out successfully in both Europe and America.

IN TIME OF COMMON DANGER.

It is very doubtful if such an organization can be made efficient over Europe alone, but it becomes chimerical when extended across the Atlantic ocean. It would be impossible to organize the American industry for such a work on domestic lines, but waiving that objection let us suppose a committee representing American manufacturers should undertake to co-operate on an international scale with the manufacturers of Europe. The real object of this Congress can be attained only by prompt and vigorous action in time of "any common danger." Delay is fatal to success. There must be the quick and wise decision carried into effect with a rapidity and a firmness that know no doubts. An event since the adjournment of the Congress illustrates this point. In July, a few weeks after the close of the Congress, the price of cotton suddenly rose from 10 to 11 cents a pound. The following items from the press state how the International Committee acted in that time of "common danger":

"Manchester, Friday, July 28.—Mr. Macara, chairman of the International Cotton Committee, has summoned by telegram a meeting to be held

in London, on Monday, to consider what recommendation shall be made to the Associations included in the International Federation for the purpose of counteracting the recent great advance in the price of raw material, brought about largely by gamblers."

Four days later:

"London, Tuesday, August 1.—At an emergency meeting of the International Committee of the International Cotton Congress held here yesterday, it was decided to urge spinners in Europe and America to refrain from buying American cotton during the next three months except for immediate wants, and thus try to obviate the danger of the next cotton season commencing with raw material at the high prices at present prevailing."

Neither the cable, wireless telegraphy or ocean steamship would enable the American cotton spinner to answer such an emergency call and aid the Committee to decide with wisdom and then to execute with vigor. The decision would be reached and executed by a few Europeans, while Americans would have no voice in the matter. In any event the real power would remain in Europe, with 85,000,000 spindles, not in America with 25,000,000. In case of a difference of opinion between the two sections, America would be told that Europe would stand no dictation. Bound hand and foot by the International agreement, no effective reply could be made.

A HOUSE DIVIDED.

Even if the execution of the plan were possible and did not involve the loss of our independence, it would introduce discord among ourselves by allying American cotton manufacturers with foreigners in order to injure another American industry. In such a conflict every condition would be adverse to the cotton industry in this country. The prosperity, the very existence of American cotton manufacturers, depend upon keeping the home market, and this in turn depends upon the maintenance of the protective tariff on cotton goods. The prosperity of the cotton grower, however, rests on no such basis. A peculiar combination of climate and soil gives the United States a practical control of cotton production for all time. Not until cotton approaches a price that is prohibitive to the consumer is cotton growing in new countries likely to be a commercial success. All the American cotton that can be grown finds a ready market throughout the world. The American cotton grower can defy competition. If, then, American cotton spinners should join the International Cotton Congress to keep the price of cotton down, they would forfeit all right to the support of the planter in maintaining that policy of protection which the cotton grower does not need, but which the cotton manufacturer must have. Alliances like the one proposed would divide American industries into warring factions and destroy the unity by which we are now so prosperous. No better way to break down our protective tariff could be devised.

Even if the execution of the plan were possible, and did not involve the loss of our independence, it would introduce discord among ourselves by allying American cotton manufacturers with foreigners in order to injure another American industry. In such a conflict every condition would be adverse to the cotton industry in this country. The prosperity, the very existence of cotton manufacturing in America depend upon keeping the home market, and this in turn depends upon the maintenance of the protective tariff on cotton goods. The prosperity of the cotton grower, however, rests on no such basis. A peculiar combination of climate and soil gives the United States a practical control of the cotton production for all time. Not until cotton approaches a price that is prohibitory to the consumer is cotton growing in new countries likely to be a commercial success. All the American cotton that can be grown finds a ready market throughout the world. The American cotton grower can defy competition. If, then, American cotton spinners should join the International Cotton Congress to keep the price of cotton down, they would forfeit all right to the support of the planter in maintaining that policy of protection which the cotton grower does not need, but which the cotton manufacturer must have. Alliances like the one proposed would divide American industries into warring factions and destroy the unity by which we are now so prosperous. No better way to break down our protective tariff could be devised.

AMERICANS ALL.

Let us now, for the sake of argument, assume that the proposed organization of European and American cotton manufacturers is practicable; and that it would not sow dissension among Americans, with all the attending disasters. Neither is true, but let us assume both to be so. This brings us to the broad question of whether the International Cotton Congress is calculated to promote the interests of the United States.

It is the object of this Congress to keep the price of cotton as near as possible to what they call a fair price, eight cents a pound. Thus at Zurich, the president of the Congress, Mr. Macara, said:

"There is little doubt that cotton can be grown at a profit in the United States at seven to eight cents a pound, according to yield."

Again in a recent interview, he said:

"Last year the price of the cotton crop was raised on an average from eight cents, which would have been a fair price."

If the International Congress having settled upon eight cents as a fair price for American cotton, had decided to establish that price by improving the methods of production and handling, its work would deserve approval as unqualified as that given to the work of Eli Whitney. That, however, is but a secondary and so far a negligible part of the program. It is the purpose of the Congress to restrict the demand for cotton by organized short time, and thus by arbitrary interference with supply and demand to keep the price as near as possible to the low level European manufacturers have decided is fair; to keep as much as possible of the world's stock of cotton in the form of raw stock and as little as possible in

the form of manufactured goods; to place on the cotton grower as much as possible of the burden of carrying this stock, and to place as little as possible of that burden on the cotton manufacturer; thus to reduce the price of cotton and the income of the planter, while increasing the price of manufactured goods and the income of manufacturer. The manufacturer is to be benefited in two ways, by a reduction in the cost of the raw material, and by an increase in the selling price of the finished product.

Now by some inscrutable means the cotton manufacturers in Europe, where cotton does not grow, may have decided correctly upon a fair price for cotton in America, where it does grow, but instead of accepting their decision I am going to assume that cotton, like all other commodities, is worth just what it will bring; that a fair price for it is the price established by free trade from the planter to the consumer of the finished product; and in view of the fact that, exclusive of the Civil War period, the average price of cotton for the past fifty-three years has been 11.96 cents, I shall also assume that under present conditions of supply and demand a fair price is the twelve cent average for those fifty-three years instead of the eight cent average of the panic year of 1896.

Now let us for a few minutes stop looking at this question as cotton manufacturers and consider it from the broader standpoint of Americans. In this country there is a large and growing family to support, 85,000,000, and 4,000 new ones every morning. In their relation to foreign countries the interests of all these people are a unit. We produce three-fourths of all the cotton grown on this earth. Of this American crop, one-third is used in the mills at home; the remaining 8,000,000 bales are sold to foreign countries. The difference on this surplus sold abroad between eight cents a pound, which the European buyers say is fair, and twelve cents a pound, which we can reasonably assume to be fair, amounts to $160,000,000 a year. That is what the United States stands to lose if the object of the International Cotton Congress is accomplished. It is equal to the value of all the land, buildings and machinery in the cotton industry of New England in 1900; it is one-half the value of the product of all the cotton mills in the United States in the same year; it is more than two-thirds of the amount paid to policy holders by all the life insurance companies in the country in 1903; it is more than one-half the expenditures for public schools in the United States; and it is eight times the amount paid for public schools in the entire cotton belt.

If brought to the country from abroad by the sale of cotton at twelve cents a pound under American free trade instead of being lost to us by selling cotton at eight cents a pound under Manchester restricted trade, this $160,000,000 would be distributed among millions of producers, throughout the South, and stimulate every industry not only in that section, but throughout the United States.

I am not objecting to the work of the International Cotton Congress from a European standpoint. What I want to call to your attention is the unutterable folly for Americans to make a foreign alliance for the purpose of lowering the price of the cotton they sell to foreign countries.

AT HOME.

Nor would the higher price of cotton which causes such a vast increase in our foreign income be likely to cause any disturbance to the domestic trade or any inconvenience to the domestic consumer. The increase in the price of cotton would be merely a change in the standard of exchange among ourselves. Owing to our natural resources and the policy by which they have been fostered, the buying power of the consumers inside the tariff wall of the United States is far greater than that outside. As consumers of cotton goods, 80,000,000 Americans are equal to 600,000,000 foreigners. Owing to this superior purchasing power and to the income from the sale of cotton abroad at high prices, twelve cent cotton, which is a calamity to Europe, brings increased prosperity to the American people. This is confirmed by recent experience. We had 5 1/2-cent cotton and adversity in 1898: 10-cent cotton and prosperity in 1905. Up to a limit not yet determined, but which is certainly beyond the 12-cent mark, the higher the price of cotton the better able is the American consumer to pay for it.

ABROAD.

Moreover the arbitrary lowering of the price of raw cotton by restricting its use in the mills, as proposed by the International Cotton Congress, causes nothing but loss to the foreign consumer. The mills of Europe dispose of a large part of their product abroad to the poorest people in the world, such as those of China and India, this trade reaching $600,000,000 a year. Now low priced cotton means low priced goods only when the distribution of both is regulated by the natural supply and demand from the cotton grower to the final consumer. Under the arbitrary control of mill production as proposed by the International Cotton Congress, the demand for goods would be dammed back at the mills and its full force exerted on the restricted supply of goods, the price of which would be increased.

The people of Asia, Africa and South America would then find that organized short time in European mills, while it might mean cheap cotton for the cotton grower, would mean higher priced goods for themselves. This arbitrary interference with supply and demand would thus cause loss to both the grower of cotton and the consumer of cotton goods, the beneficiaries being the European cotton manufacturers, first, last and all the time.

MANIFEST DESTINY.

Americans can raise no valid objection to this plan of the International Cotton Congress so long as American cotton manufacturers are not a party to it. It is the legitimate, natural and desperate remedy of manufacturers in so artificial, peculiar and perilous a position as are the cotton manufacturers of Europe. We can recognize the European position and surely they will recognize ours. The American course is clear. The United States is the only country possessing all the requisites of a practical independence in manufacturing cotton goods of all grades. We can leave other countries free to operate their mills as many or as few hours a day as they choose, to meet in their own way the peculiar problems which confront them.

We have only to bring our machinery and processes of manufacture to the highest efficiency, maintain cotton, wages and cotton goods at an American level, retain the home market, and extend our market abroad as far as possible, in order to realize the highest possibilities of cotton manufacturing in America. These we may fairly hope will include a control of the manufacture of cotton goods as complete as our present control of the production of raw cotton.

FRATERNITY.

Although the main purpose of the International Cotton Congress has nothing to commend itself to Americans, we should not lose sight of the many mutual advantages in international intercourse and a better acquaintance with our foreign friends. We have many interests in common with them. There are many lines of work that would be for the benefit of both. Among these may be mentioned the minor questions already taken up by the International Cotton Congress such as improving the baling of cotton, unifying the weights and measures of the textile world, and combating the evils of speculation. My visit to Manchester led me to believe that the cotton manufacturers of Europe are desirous of co-operating with the cotton growers and cotton manufacturers of America, and that they would be glad to send representatives to this country to investigate on the spot certain questions whose solution is for the benefit of all. They are restrained from taking this step by the fear that such a visit in the absence of a formal invitation from the manufacturers and growers of America would be taken as an affront, as an unwarrantable intrusion into their neighbor's affairs. There are, however, many conditions in the United States which they, as buyers of 8,000,000 bales of American cotton every year, have a right to investigate on the spot and discuss with authority. This field for investigation and discussion could be greatly extended with benefit to all and without arousing any conflicting or divergent interests, if the cotton growers and manufacturers of the United States would meet foreign manufacturers half way in their evident desire for a friendly international conference.

The suggestion in the closing paragraph of the Dale report that steps be taken to bring about closer relations between European manufacturers and American cotton growers and manufacturers was adopted by the following resolutions:—

Resolved, That the Board of Government be authorized to invite delegates from the International Federation of Master Cotton Spinners' and Manufacturers' Associations to attend our 80th Convention, to be held in Boston in April, 1906, and also to confer with the Southern Cotton Association and other manufacturing associations regarding the advisability of holding about the same time a joint conference of representatives of the manufacturing and cotton growing interests of America and Europe.

Resolved, That the New England Cotton Manufacturers' Association favors the appointment by Congress of a Commission of Cotton Experts to visit foreign countries for the purpose of investigating the possibilities and requirements of foreign markets to the end that the export trade in the cotton goods may be greatly increased.

Whereas, The unreliability of Government crop reports and leaks in the Bureau of Statistics have tended to increase speculation in cotton futures, and

Whereas, The cotton manufacturing industry of the world has been greatly injured in recent years by speculation or gambling in cotton futures, which is undoubtedly in contravention of existing national and state laws:

Be it resolved: That the New England Cotton Manufacturers' Association in convention assembled requests the President of the United States to appoint a Commission to investigate the best methods of issuing Government crop reports, and also to investigate the subject of gambling in cotton futures, to the end that some way may be devised to restrict improper trading in cotton and to protect the legitimate industry of cotton manufacturing from these pernicious influences.

Resolved, That the thanks of the association are due and are hereby tendered the speakers for their able and instructive papers, and that special thanks be tendered Samuel S. Dale, Boston, Mass., for his services in representing our industry at the recent International Congress of Master Cotton Spinners and Manufacturers.

The report on the International Congress was followed by a paper on Welfare Work, by H. H. Vreeland, President Metropolitan Street Railway Co., New York, which is referred to in another part of this issue. At this and succeeding sessions a number of excellent papers were read, while W. E. C. Nazro, of North Plymouth, Mass., gave an interesting talk on Welfare Work. The papers were as follows:—

THE RELATION BETWEEN FUTURE CONTRACT AND SPOT COTTON.

CHARLES C. COWAN, 27 William St., New York City.

Although realizing fully that we are in the midst of a period remarkable for its rapidly changing conditions, its sudden reversal of precedents, and the frequency of its epochal results, the commercial world for the past two or three years has been contemplating not only with increasing surprise but with, I might say, amazement, the developments which have been and are now taking place in the cotton industry. A section which produced seven million bales of cotton a few years ago, produces this year nearly fourteen million bales. Ten years ago, a ten million bale crop represented such a surplus of the raw material that cotton sold in the South at four cents per pound and many planters were bankrupted. Last year a ten million bale crop created such famine conditions that speculation was induced to enter the market and run cotton up to seventeen and a half cents. And this year, notwithstanding the enormous supply of raw material derived from a crop of nearly fourteen million bales, notwithstanding the unprecedented volume of cotton goods that have in consequence been delivered to the consuming world,

the latter portion of the crop was marketed at between ten and eleven cents in the South and the price of goods is unusually high owing to an actual scarcity in the supply.

Concomitant with these phenomena the complexion of things about our cotton exchanges has undergone a transformation as radical and unexpected. Where we formerly had changes of one to two cents per pound in cotton futures gradually developed during a period of twelve months, with intermediate fluctuations of from ten to twenty-five points the rule, we now have changes of six and eight cents per pound during a fiscal year, with intermediate fluctuations of fifty to one hundred points a month the rule—often in a week, sometimes in a day or an hour. The reason for the frequency and violence of these fluctuations is to be found in the fact that a large proportion of that public speculation which formerly confined itself to stocks and grain has entered the cotton future markets, increasing the volume of the transactions from three to five hundred per cent. and relatively increasing the magnitude and rapidity of the contract price changes. For instance, in the New York Cotton Exchange a few years ago a dull day was represented by total transactions of forty to fifty thousand bales, while 250,000 bales a day was considered active trading, and when daily transactions were much above that volume the market was in an excited condition. Now, the average day's trading is from a quarter to a half a million bales, while 750,000 bales a day is not unusual, and the daily transactions have amounted to a million and a half bales. As an evidence of this increased business in options the value of seats in the New York Cotton Exchange has risen from $600 in 1900 to $15,000 in 1905.

These fluctuations in future contract prices are so often out of proportion with the fluctuations in the price of spot cotton, and future quotations are so generally at variance with a proper parity between the two, a much greater element of risk, and often the element of great danger have become features of the hedging process in which future contracts are so largely employed by the spinners and spot dealers of the world, and the relation between the future contract and spot cotton is continually becoming more strained. That the existing condition is attended with great jeopardy to the cotton trade in general, there can be no question. The spot dealer sells cotton for forward delivery to the mills at a fixed premium over a certain option and buys that option as a hedge; or the spinner sells goods for forward delivery based on the then existing value of actual cotton and buys an option for his protection; and when the transaction is closed futures may have declined half a cent more than the spot cotton and the options that had been bought to secure reasonable profits will transform these prospective profits into a loss of over two dollars per bale. On the other hand, the spot dealer will anticipate the future wants of his customers by buying actual cotton, paying for it a certain basis as compared with the price of futures, and will sell an option against it; or the spinner will sell an option against his surplus stock or raw material or goods; and when the transaction matures the options may have advanced a half cent more than the actual cotton, and the future contract that had been sold for a protection becomes a source of actual loss. These are but two of the many phases of danger which ramify the situation, and, although we realize that the future quotation is necessarily in the long run but a manifestation of the real value of the raw material, these unexpected and radical temporary variations in the relation between the two have resulted in a chaotic condition which often turns awry the calculations of the wisest merchants and spinners.

The problems which confront those who seek the causes producing these conditions and any effective remedies therefor are very complex and only partial solutions seem within the bounds of reasonable hope. In my endeavor to analyze the situation, I find that on first thought speculation seems to be the principal and most potent cause of the great disturbance in conditions. And yet the question irresistibly suggests itself whether speculation is a cause or an effect. It is undoubtedly, the direct and immediate cause of these violent and sudden fluctuations in future contracts which vitiate so often their value for hedging purposes. On the other hand, speculation can be nothing else but the result of conditions propitious to its operation. As long as the spirit of humanity is attracted to new lands of promise and new fields of quick fortune, just so long will speculators flock to take advantage of conditions which seem to offer the opportunity for speedy and profitable returns. In proportion as the favoring conditions are removed will speculation be driven to seek other fields.

That the option markets are absoluutely necessary to the commercial end of the cotton industry there can be little doubt. For without this protection neither the merchant nor the spinner could plan a month ahead with safety. In this progressive age, when every known branch of commercial life, from the manufacturer to the consumer, from the banker to the producer is pervaded with the spirit of anticipation, let us not indulge in the Utopian hope of eliminating the element of chance from the cotton trade. Speculation and anticipation are but varying manifestations of the element of chance. Eliminate this element and individual effort and ability count for nothing. Successful anti-option legislation is a chimera which will never materialize to upset the calculations of the merchant and the manufacturer. No, after all, the final arbiter of values must be the price the consumer of the goods is willing to pay, and rather than attempt to destroy speculation let us endeavor to put upon it an automatic governor, so that the magnitude and frequency of the fluctuations may be minimized. And how is this to be accomplished?

Many schemes have been evolved. One suggestion was, that actual delivery be required on all future contracts. It is evident that this would destroy their usefulness as hedge sales against stocks of cotton or goods, where the sellers were simply seeking to secure themselves against a possible decline. Another suggestion is that the planter and spinner get together on a community of interest plan. There is no question that the stability of the planters of the South during the past cotton season checked a spirit of demoralization bred by bear speculators that would have depressed cotton to a price that would have

worked great injury to the spinning trade that had taken over six million bales earlier in the season at prices ranging above ten cents. It is equally true that the willingness of the planters to market the remnant of their crop in the spring of 1904 at prices which would net the buyer three to four dollars a bale on New York delivery, caused the speculative bubble which was headed for 20 cents to burst, and gave normal conditions a chance to reassert themselves. Theoretically, neither the planter nor the spinner should lend his assistance to speculators to bull or bear cotton. But, when the time comes that the spinner shall oppose the bear speculator who is trying to assist him in buying his cotton a cent or two per pound cheaper, or the planter shall antagonize the bull speculator who is endeavoring to enhance the value of his product five or ten dollars a bale, I shall expect the biblical lion and lamb to lie down together. No, we seem to have but one hope, and that is to bring about such changes in the nature of the future contract as shall make it intrinsically more valuable, or in other words, make it represent more exactly the actual value of spot cotton as spot cotton is known in the spinning world.

As is well known, future contracts are so much less desirable than spot cotton as known to the consuming centres that they sell almost constantly at a discount. Spot quotations in the Southern markets are usually the same as future quotations in New York, where there should be a difference of seventy-five to a hundred points. For this there are three reasons. First, the great variety of grades that can be included in a contract. These contracts, covering 50,000 pounds of cotton can contain anything from good ordinary white, or low middling stained up to middling fair. I have seen certificates that included fifteen to twenty grades in one hundred bales. What spinner can use cotton in such mixed lots? And if contract cotton has no value for the spinner, of what use is it but to depress the market? In grain contracts the grade is uniform. I claim that each contract should be classed for middling, good middling, or low middling, with nothing in it running more than half a grade above or below, and white and stained cotton should be treated separately. Second, the differences arbitrarily fixed on the grades above and below middling for delivery purposes do not always coincide with the differences actually existing in the spot markets. It is clear that if the premium in the future contract on good middling over middling is 45 points, and good middling is actually worth a premium of only 25 points; or if the discount in the contract on low middling is only 35 points and the actual discount is 55 points, the buyer of the contract is the loser by 20 points, or a dollar a bale. And I desire to make it plain right here that it requires buyers to make a market. A good market for buyers is always a big market, and while the above mentioned features may enable sellers to bring cotton spasmodically that would not otherwise reach the future markets, in the final results it drives away the buyers and the consequence is the contract market accumulates less stocks of cotton in proportion to the undesirableness of its contracts to buyers. The third cause for the discount on the future contract, and its unattractiveness to the buyer is found in the matter of staple. All future contracts are supposed to be based upon the average of the grade which is produced each year in the South, that is, middling. Any grade below middling must be discounted, and any grade above middling must be allowed a premium. And yet the shortest staple grown in the South can be tendered along with the average without paying any penalty.

Exclusive of the extra staple cottons, the average length of staple produced in the South is one inch. A premium is allowed on all cotton that is an inch and an eighth or better, but no discount is charged against cotton running only five-eighths or three-quarters of an inch. The lands which produce such short staple usually produce a weak fibre, and few of our spinners can use such cottons at all. The consequence is they accumulate in the contract markets, since they can be bought in the South at a great discount, and delivered in the contract market without a discount. This feature accounts very largely for the disparity between spots and futures. I recently saw middling tinged inch to an inch and sixteenth cotton sell in New England at 11 3/4 cents, when the current month was selling in New York at 10.75, and the discount on tinged cotton would have reduced it to 10.63 on a contract. No, the contract markets should attract and hold the largest stocks of spot cotton in the world. There is no unsurmountable reason why New York should not handle two million bales of actual cotton a year and carry a normal stock of half a million bales. What an advantage it would be to the spinners of New England to have a large accumulation of cotton so near by. What a balance wheel it would prove to the designs of speculators. Make the future contracts represent actual cotton as it is generally known to the trade, and the accumulations in the option markets will become attractive to the merchant and useful to the spinner, and the future markets will become the largest spot markets in the world. The stocks then would not be small accumulations of nondescripts that could be used as hammers to depress prices unduly, and few bulls would have the temerity to undertake to corner a stock of half a million bales.

MARKETS FOR COTTON GOODS IN CUBA.

BY A MERCHANT OF CUBA.

(Written in Spanish, and Translated for this Meeting.)

Lienzo Crudo. (Sheetings.)—Used in widths of twenty-five inches. It is essential to deliver these finished to render them acceptable. Goods at three and one-half cents finished are preferable to those of four cents not finished.

Loneta. (Brown Drill.)—This cloth has always been obtained from the United States, as it does not require finishing. If some good qualities could be manufactured in twenty-five inch widths and could be made with special finish, these would take the place of union goods.

Cutre Blanco. (Bleached Muslins.)—The greater part of the consumption of these goods is at present obtained from the United States, and not solely from the advantages under the tariff, but on account of their finish which is made as they are required.

Of this article, especially in width of 7/8 yard, there are imported more than a half million of fifty yard pieces.

Nansu Blanco. (India Linen.)—Used in widths of eighteen inches of 64 by 60 threads, weighing twenty-seven yards to the pound and in widths of twenty-five inches of 80 by 80 threads, weighing eighteen yards to the pound; this latter quality is also used in thirty-inch widths.

Listados. (Ginghams.)—A beginning has been made to consume this cloth from the United States in preference to others, since it counts more to the threads, viz., 60 by 54, instead of 52 by 48, and has one inch more of width (twenty-six inches), and whose quality and weight are better.

There ought to be made a cloth that counts 52 by 48 threads in twenty-five-inch width of 6 1/4 yards to the pound with special finish, since otherwise it would have the appearance of inferior quality.

Irlandas. (Madras.)—These are made in thirty-inch widths in pieces of twenty-four to thirty yards, double fold. The qualities from seven to ten cents a yard, which are the most consumed, require modification in their finish. It is necessary to manufacture these in designs in accordance with the taste of the country.

Drills Woven Similar to Cottonades.—These are made in the United States in qualities acceptable to the Cuban market. It would be advantageous to modify the finish of some of these goods. They ought to be made in designs which meet the market.

Hollands for Dresses, Cloth Lighter Than Cottonade.—These are made in the United States, in suitable finish and qualities. There ought to be offered a greater number of designs, to meet the tastes and requirements of the country.

Estampadas. (Percales.) Twenty-five Inches, Prints.—These are always purchased from the United States. Their consumption has increased.

Olandos Estampados, Twenty-five Inches. (Prints in Lawn Finish.)—This is one of the articles of greatest consumption. At present they are made in the United States, and the houses that make them sell them in regular quantities with good success, since they print them according to the tastes of the country.

Driles Estampados. (Printed Drills.)—They are beginning to consume these, with preference, from the United States since the reciprocity treaty.

In consequence of the rise of raw cotton it would be advisable to manufacture similar qualities at lower prices.

THE NATIONAL WHOLESALE DRY GOODS ASSOCIATION.

W. N. MOORE, Kansas City, Mo.

Now you know that we are all prone to say things by word of mouth, which we would hesitate to reduce to writing. A written statement is considered a formidable document by a credit man, which I happen to be, therefore, my views of the lightness of the obligation resting upon me underwent a decided change. I began to feel about as I imagine the young widow felt whose husband, a supposedly wealthy man, had not been long dead. Soon after her husband's death, she unexpectedly had much to do with creditors of his estate, with the adverse claims of his relatives, and consequently with the courts and lawyers. After she had paid the debts, settled with the relatives, and paid the costs of litigation, including her attorney's fees, she confided to a friend that she was almost sorry John had died.

So when I came to prepare this paper, I realized that I had assumed an obligation greater than I had anticipated, and that what I wrote Mr Burnham about my incapacity is nearer the truth than I thought when I wrote him.

I am consoled, however, by the thought of the old adage that "brevity is the soul of wit," and in giving you an outline of the origin and purposes of the National Wholesale Dry Goods Association, I shall try to make good by brevity what my story shall lack in wit.

The Association may be said to have had its birth in the city of Chicago, in December of 1903, at a meeting which was attended by representatives of the majority of the wholesale dry goods dealers of that part of the country known as the middle west. The motive of its organization lay in the recognition of the following facts.

That while there were comparatively few wholesale dealers in dry goods, there existed a strange lack of acquaintance between them. That there had grown up in our business many evils which were serious hindrances to its successful conduct. It was thought that a better acquaintance between ourselves would be mutually helpful and that by common consent we might be able to abolish some of the practices which hampered, if they did not threaten the existence of the calling in which we are engaged.

It was also thought that such an organization would tend to make more cordial our relations with the membership of your association, and other manufacturers, as well as with commission merchants and our customers. But, perhaps, no words of mine would amplify Article II of the constitution adopted by the association at its organization, which reads as follows:

"The object of this association shall be the promotion of more friendly business relations, and mutual confidence and good will with each other and those with whom we have dealings."

This is the broad and strong foundation upon which we are building, and we believe that when the structure is finally completed it will be an edifice of which we may all be proud, and a lasting monument to all those who have assisted in its construction.

As before stated, the charter membership of our association was made up of the dealers of the Middle West, and it was a serious question with us whether it was either desirable or possible to make the association national in its scope. It was decided to be desirable, and the result of our efforts shows it to have been possible, for now our roster includes the names of nearly all the prominent houses of the country outside of New York City and San Francisco, and we hope to have them with us at no distant day.

Our association has already been productive of much good to its members. One of the good results immediately accomplished was an increase of confidence and esteem by our members for each other. This has come about through personal contact and acquaintance. We have learned that the fellow who as our competitor has been held up to us by our salesman as the "bogie-man" causing the salesman's resort to improper methods in obtaining business, is after all an honorable competitor,

that he does not go about with a bowie knife in his teeth seeking a price to cut and that he is anxious to conduct his business on a profitable and proper basis. By reason of this discovery we have also learned the additional fact that our worst competitor is within our own walls. That we need not dread the competition of a business rival more than the disposition of some of those in our own employ to sacrifice our interests for their own selfish ends. Other good results have come to our members through the medium of our association not necessary to mention here.

There is one object however, which we are seeking to accomplish, in which you gentlemen are directly interested. I have reference to the sale by manufacturers and commission houses to the retail trade. This is looked upon by our members as a matter of great importance. It is also regarded by them as a great evil, and one which has rapidly grown in recent years. It has been the subject of much thought on the part of individual members; of careful consideration by the entire association at two of its meetings, and the result has been the unanimous adoption of a resolution, a copy of which has probably reached each of you, and which reads as follows:

"Having fully considered the subject of 'Sales by Commission Merchants and Manufacturers to Retailers' it is hereby—

"Resolved: That the members of this association intend to give preference in their purchases, as far as possible, to the commission merchants and manufacturers who sell only to the jobber or manufacturer; or who sell in proper quantities to those retailers only, who do an annual business of one million dollars or over, when in so doing the same may not be considered as especially unfair to the jobber; or who sell to retailers only such merchandise as is not handled by the ordinary jobber to any extent (that is to say, high class merchandise which jobbers do not handle).

"It is understood that no party is to be considered a jobber who does not carry a jobbing stock of merchandise constantly on hand and is generally considered as doing a regular jobbing business. It is further—

"Resolved: That commission merchants and manufacturers who sell to syndicates of retailers, each member of which does not sell annually at least one million dollars, are injuring the business of the members of this association, and that the purchases of our members should be made whenever possible, from those who refuse such business."

Before its adoption the subject was considered by our association from a broad point of view with the knowledge that it was a delicate one. It was conceded that there were two sides to the question, and that, if the problem was to be satisfactorily solved, both sides must be considered and dealt with in a spirit of fairness.

There can be no doubt that the practice must be curtailed, or there will follow in rapid succession a series of funerals the star part in each of which will be played by a wholesale dry goods dealer. I think it equally true that while the first few funerals may attract nothing more than passing attention from the manufacturers they will soon take a lively interest in stopping the epidemic which will be blotting out the business of jobbing dry goods.

I have heard it said that the position in the commerce of the country now occupied by the jobber is an untenable one; that it is only a question of time until he will have been forced out of existence by the inevitable evolutions of trade. I admit that if the practice continues to grow by which retailers are enabled to make their purchases at first hand on the same basis as the jobber that it is only a question of time until the funeral processions before mentioned begin to move; but how will that affect the manufacturer?

As the business of jobbing dry goods is now conducted, it requires large capital and the liberal use of credit, that there may be carried at convenient points of distribution, large assortments and large quantities of the merchandise necessary to supply the wants of the retail trade. The stock so carried is the accumulation under one roof of the products of thousands of different manufacturers scattered over the entire face of the globe. These wares are thus made subject to the convenient and ready inspection of the individual customer who may call at our places of business, and samples of them are also carried by our traveling salesmen into every accessible hamlet of the land.

The jobber must invest his capital in this merchandise, take all the chances of the market and be prepared to deliver the goods the moment his customer demands them. He must employ a large force of salesmen, and cover a wide scope of country. This he is enabled to do only because of the wide variety of the goods in which he deals and the large volume of business transacted; and he thus keeps to a lower figure the percentage of cost of marketing the wares than can be accomplished by any other method.

Again, he must be prepared with his capital and credit to sell to his customers on liberal credit terms, and in many cases comes nearer being the banker of his customer than are the banks of the customer's own town. Margins have been cut until the only chance of conducting the business profitably lies in doing a large volume of business. What other means can the manufacturer find for the distribution of his product as economical as through the medium thus afforded by the jobber? It is out of the question for him to employ a force of salesmen sufficiently large to enable him to offer his wares to the large number of customers who might be interested in them, for to do so would make the cost of marketing his product prohibitive. And for the same and other obvious reasons it is equally as impossible for him to induce such retail merchants to visit his factory or to maintain exhibition stocks at the principal centres of trade.

Therefore, we submit that the jobber offers the manufacturer the most economical medium for the sale and distribution of his products in this country. That being conceded there can be no question that it is to the interest of the manufacturer to protect the jobber. We also insist that the retailer has a large interest in the protection of the jobber, who furnishes him with the means of buying great varieties of merchandise in such quantities as may best suit his needs. It has been my observation that disaster comes to the retailer so often because of his yielding to the temptation of buying in larger quantities than his business demands as from any other one cause.

It must be admitted that it is not fair that the manufacturer should depend upon the jobber to buy in advance three-fourths of his product, so that he may have a basis upon which to operate the plant regularly, and then take the other fourth to the most desirable of the jobber's customers and sell them in direct competition with the goods which he has previously sold to the jobber. It is this practice, which has grown more and more prevalent, that we say should be stopped. We have appealed to you, gentlemen, to assist us in stopping it, and we say to you in turn that we will show our appreciation of your assistance by bestowing our patronage upon those who faithfully support our contention in practice as well as promise.

It is the source of great satisfaction to the National Wholesale Dry Goods Association that the letter sent by it in June to the manufacturers and commission houses, setting forth the resolution which I have quoted, and asking for an expression of views on this subject, has met with such a generally favorable reception, and we feel that this fact augurs well for all parties concerned.

I have stated that it is recognized by our association that there are two sides to the proposition. I have given one side of the case, and in fairness must refer to the other. It is admitted that there are some manufacturers who produce a grade of goods a larger proportion of which must be marketed direct to the retailer. Again, there has grown up in the cities and larger towns of the country the so-called department store, employing large capital, carrying large stocks of merchandise and doing a large volume of business. This class of retailers, because of the large quantities of goods handled, may, with more or less justice, claim the right of making their purchases at first hand. This condition, and the right of the manufacturer to sell them certain lines, in proper quantities, has been recognized by our association, and we have defined in a measure, our views on the subject in the resolution before quoted.

It is recognized by our association that the line so drawn may in justice to all parties require modification. It is our disposition to confer with other interests affected, to consider any changes that may be suggested, and to arrive ultimately at an understanding which shall be equitable and in keeping with good business sense.

When we adopted the resolution to which I have referred, perhaps we should have gone further, and provided more adequate machinery for giving effect to the plan by conferring authority upon some one or more to modify its provisions to meet conditions. This will doubtless be done, and I hope to see matters so adjusted that negotiations may be carried on between a representative of our association and the manufacturer, or commission man, either as an individual or through the medium of your and similar associations, with the view of adjusting differences and smoothing rough places on a basis satisfactory to all.

It was the broad and equitable principle of "live and let live" which actuated our association in the adoption of the resolutions which I have discussed, and we believe that it will be received by you gentlemen of the New England Cotton Manufacturers' Association and other similar organizations, in the same spirit.

SOME COMPARATIVE DATA ON MOISTURE IN COTTON AND WORSTED.

BY WILLIAM D. HARTSHORNE, Lawrence, Mass.

The standard condition upon which worsted yarn and tops, combed without oil, are bought and sold, both in England and on the Continent, is taken at an allowance of 18 1/4 per cent. regain. The standard for silk is 11 per cent. regain, and for cotton is 8 1/2 per cent. regain. The meaning of this statement is that the buying and selling weight of 100 pounds of absolutely dry stock is for each material respectively 118 1/4 pounds, 111 pounds and 108 1/2 pounds. This statement does not mean that these exact amounts of moisture are at all times expected to be found in these respective materials. On the contrary, the well known possible variations from these states of condition is the reason for assuming some definite standard to buy and sell by, in order that each party to a transaction may be fairly dealt with, and can know as precisely as possible what he is doing. Theoretically, it makes absolutely no difference whether the standard condition of regain be assumed at one figure or another, provided, only, that the actual condition is known, and that some standard has been agreed upon between the buyer and the seller. Practically, however, it is desirable that the standard condition should be somewhere near the average which may be expected for the country or countries within whose borders the transaction takes place, and that at the time of delivery the material shall be in its whole mass as near as may be in this state of condition. If this were not so it would be difficult to accurately allow for the changes in weight which might readily take place while in transit, or upon the least exposure, to the satisfaction of both parties.

The inside of a mill, particularly in the winter time, unless artificially provided with moisture, will have a relative humidity much less than the outside air, and stock running in such a mill, not so provided, will lose moisture. If shipped in this state a proper allowance must necessarily be made by the seller, either in his weight or in his price, or he will be cheating either himself or his purchaser. To a mill which weaves its own spinning and sells its product by the yard, the subject may seem of little or no importance from a commercial point of view, but even here the knowledge of what constitutes the best working conditions and what degree of atmospheric humidity for a given temperature will give the best results, may be of great importance.

About ten years ago I began collecting data to determine if possible the average natural condition of worsted yarn in this country, or, to speak more accurately, what this condition was for the neighborhood of Lawrence, Massachusetts. The general impression had seemed to be that for our climate a difference of from two or three per cent. would be expected between this country and England or the Continent, and for our newly developing top business a basis of 15 per cent. regain had already been assumed as probably a safe standard; but it seemed best to establish what it ought to be with some degree of certainty. With this object in view, a skein of worsted yarn was prepared whose absolutely dry weight was carefully determined by weighing and testing other skeins of the

same material under exactly like conditions. This skein was then hung up in an open shed, protected from the sun and rain, but with good ventilation, so that it could be considered as fairly representing the outdoor conditions. Its weight was then carefully taken and recorded ten times a day, at approximately equal intervals, for every day in the year except Sundays and holidays, for a period of one year from May 1, 1895. A record was also kept of the temperature and relative humidity, as obtained from the readings of a set of wet and dry bulb thermometers, located within a few feet of this skein, and taken at the time of each weighing, except for a short time in the winter, when the humidity observations were omitted owing to the difficulty of obtaining them accurately at low temperatures.

The variations in the weight of this skein were remarkable, ranging from a little over 7 per cent. to as high as 35 per cent. on the original dry weight. There were occasional variations of from 15 to 19 per cent. in 24 hours.

These observations gave for outdoor conditions a general average for the year of 17.45 per cent. or something less than the standard allowed abroad, and without attempting at the time to go further into the law of change, we felt that we had at least demonstrated that a standard of 15 per cent. regain for worsted, as had already been assumed, was conservative for this country. Since the promulgation of the standard by the Arlington Mills in their regular business dealings in tops, all other top makers of this country have, I believe, adopted the same standard, and it may be said to be universally accepted by the trade in this country, so far as tops are concerned, and its general acceptance on worsted yarn is, perhaps, only a matter of time. So far as I know, no effort has yet been made to adopt a standard for cotton in this country, though it is generally assumed that the standard should be about half that of worsted, or say 7 1/2 per cent. (the foreign standard is 8 1/2 per cent.). This at any rate would be a convenient amount to figure for.

RECEIVING AND GIVING OUT SUPPLIES.

GEORGE A. AYER, Easthampton, Mass.

Supplies are an expensive manufacturing necessity; that economy in use is necessary goes without saying. Any system that will compel the care and attention of all concerned, either in buying or using, is of value. It follows that some systems are better than others; also that no one system would meet all conditions.

The system that I am about to describe has been in use in plants of from forty to sixty-five thousand spindles and has proved fairly satisfactory.

In purchasing, all orders are placed by the manager. Each order is typewritten on printed forms with two carbon copies; the original is sent to the supply-house, one carbon is held in the office, and one copy is given to the person who is to receive the goods. These forms are numbered in sequence, and as much of the detail of the order is written as may seem best.

On receipt of bills from the supply-house, another form is filled out by the office showing the details of the goods billed and the number of the order on which they belong. This form has blank spaces for the count, weight, or measure of the goods received, also for such comments as may seem necessary. When filled out by the receiving clerk it is returned to the office to be used in checking the bills. When the order is complete the first form given to receiving clerk is returned to the office and filed with the office copy.

Now as to storage of supplies. The most satisfactory method experienced is to have separate lockers for the larger items, all goods to be locked up and the keys in the hands of the manager and receiving clerk.

As to giving out supplies, this is done at a certain day and hour and to the overseers in person. Friday morning at nine o'clock is the usual hour and each overseer presents himself at the supply-room with a list of supplies needed, in writing and signed by himself. As the goods are given out they are charged against his department and become an item in the costs of his department. He surrenders his order to the supply clerk.

It is assumed that the mill has been well started and has all the needed supplies for successful operation. Then, to obtain more, it is a rule that evidence in the shape of the old and worn goods is needed. For example, if you want brooms or brushes you must return the worn ones. Are you in need of lug straps or other loom supplies, you must produce evidence in the shape of properly used and worn supplies of like kind.

This system is carried out throughout the mill. Each overseer has a supply cupboard, and all hands must return the old before receiving the new.

The method makes clear the manner in which supplies have been used.

In cases where the supplies are inventoried quarterly, it is well to have a small book in each closet and debit or credit the same as the goods are received or given out.

COTTON COMBING.

ROBERT BURGESS, Pawtucket, R. I.

In considering the question of combing cotton, the conditions vary so in different mills that it is difficult to discuss the subject profitably in a brief paper. The first essential is to produce a good, clean fibre, but if this was all that was required the combing machine might be dispensed with, because it is possible, under the right conditions, to card cotton so as to get the yarn practically clean. While clean yarn is the first essential, the matter of lustre is of very great importance, this being brought about by the process of combing, which straightens and lays parallel the fibres, thus allowing their surface to show up to the best advantage. While it is possible to clean cotton without combing, it is not possible to give the lustre to the carded yarn, on account of the fact that the fibres have not been thoroughly straightened and are curled and crossed to a greater or less degree.

The different opinions as to what constitutes a first-class combed yarn make it rather a difficult matter to handle, but as cleanliness is without question the main point, that method of handling which gives the cleanest yarn is without doubt the safest one to consider. In establishing a standard as to quality, it is well to bear in mind that there is no mystery about it, no secret process, and, given the same quality of cotton and make of machines, about the same results should be obtained

by all. This being the case, what is necessary to obtain the best results? We find that fine mills abroad use a good grade of cotton, with the most careful handling through the picking and carding process, then combing the same twice, or "double combing," as it is termed, in order to get satisfactory results. If they find this is necessary, it is safe to accept this as a standard, and it is also safe to say that the further away we get from this, the quality of cotton used and the quantity produced by them, the more inferior will our quality be. Yarns that are perfectly satisfactory for one class of work are not satisfactory for another. There are certain lines of cloth that are perfectly satisfactory to the trade if the yarn is fairly even and will give a fair amount of lustre, cleanliness being a secondary consideration. For cloth of this character, it is possible to put through the comber a very large quantity of work of a quality that would not answer at all for cloths of another character so that in taking up the question of quantity the first consideration is that of quality, or, what the yarns are to be used for. The great danger ahead of us in this line is that of forcing too much cotton through the machines. Unfortunately the machine is capable of taking care of a large quantity of cotton, and because it is possible to put it through the machine it is often done with detrimental results. It is only a few years ago that the revolving flat card was exploited as a great machine for quantity. There did not seem to be any limit to the amount of work they were supposed to do, but what is the situation today? The quality of yarns demanded could not be furnished with this excessive product, the result being that today the product of a card is a variable quantity, with the maximum far below that of a few years ago. We seem to be passing through this same experience in regard to the process of combing cotton, and we will probably learn by experience as we did in the matter of carding.

One of the principal causes for our present condition, or demand for machines of large production, is no doubt, the mills already in operation are trying to change their work to a finer quality of yarn, and their floor space is so limited as to make it almost impossible to meet the requirements, hence the demand for a large production from each machine, and the result has been to stimulate the inventive genius of cotton machinery builders the world over, with some very satisfactory and practical results. With the old type of comber the increased width of lap, together with changes in construction to enable the machine to run at a high rate of speed, have increased the production without materially affecting the quality of work. In the newer types of combers, the new detaching devices have made it possible to handle a considerably heavier lap than formerly, thereby adding a new feature to the combing process, that of fibre cleaning, as well as of needle cleaning. This new development of the principle of fibre cleaning explains the apparent paradox that one head of a comber employing this principle will do more work than eight heads of the old style comber and clean it better.

In stapling cotton, when the staple is laid on your coat sleeve, it is fairly well cleansed and combed, though it has never been through a machine, nor had a needle passed through it. What has cleansed it? Simply the pulling of the fibres out of the bunch of cotton held in the hand. This is fibre cleaning, and the same principle has been carried to a high degree of success in some of the new combing machines. In these machines the good fibres are pulled by the detaching rolls from the mass of cotton through the top comb. More cleaning of the good cotton from nebs, short fibre leaf, etc., is done at this point than any other in the combing process. This heavy lap, with the extreme width and high speed, gives a production per foot of floor space far in excess of the old type of comber. I think it is safe to say that all manufacturers know a good piece of cloth when they see it, but again, unfortunately, they do not all know thoroughly the details as to how it is produced, and the statements they may hear from time to time are apt to be taken as facts, when, if a few questions are asked, the matter would have a totally different aspect. For instance, the statement is made that a certain mill is producing a certain number of pounds per comber, and it is found to be far in excess of what you yourself may be doing, and still your own work is not entirely satisfactory. You begin to fear that your men or machines are not doing the amount of work that they ought to do, and, trying to force your work up to that of the other party, you get into serious trouble, when if all conditions were known, it would be found that it was far easier for the other party to get his large production than for you to get the smaller production.

The product of a comber is controlled more or less by the grade of cotton used, and the preparation of the same, so that in making comparisons as to product be sure to inquire carefully into the grade of cotton used, also the picking and carding capacity, especially the quantity carded of the plant under consideration.

In handling cotton from the cotton plant through to the finished cloth, every process gives one more chance to improve or spoil it, and in manufacturing combed yarns, especially when the finer end is taken into consideration, nothing but the best will do, and it is necessary to start with the best grade of cotton. While strict middling cotton, with very light picking and equally light carding, with a high percentage of cotton taken out in combing, may give fair or passable results, still far better results can be obtained from the better grades of cotton. On account of the price we have to pay for the better grades of cotton, the temptation is very strong to use lower grades and try to make passable yarns therefrom. With combing machines constructed as they have been, it has been practically necessary to buy commercial quarters, in order to handle it, the machines not being adapted for handling the shorter cottons. So far as actual spinning is concerned, this staple or cotton has often been entirely unnecessary. Shorter cotton would answer for all the requirements outside of those of combing machines.

One of the most important advances in the line of combing cotton has been the invention of combers for the practical handling of short cottons. It is safe to say that the full value of these machines is not yet thoroughly understood. Possibly one reason for this is that the high price asked for the machines has stopped further investigations, or it may be that manufacturers are not yet satisfied as

to the practical workings of them, but however this may be, when manufacturers stop to consider the advantages of combing short staple cotton, it does not seem to me that there can be any question as to the outcome. The possibility of making better goods with increased production at a much less cotton cost will sooner or later force itself upon us as one of the economies that must be taken advantage of. These combers, like the revolving flat card, will take care of a large production on short cotton, giving satisfactory results, but again like the revolving flat card, when long cottons are used, the production must be reduced if satisfactory results are to be obtained.

These few remarks have been made to sound a note of warning against the extreme high production that is at present being exploited, which is very misleading to those who have not had experience along this line. If quality is not to be considered, then quantity is possible, but if first-class work is demanded, then quantity will have to be a secondary consideration.

COTTON WASTES.

EBEN C. WILLEY, Hope Mills, N. C.

Waste of whatever kind about a cotton mill is the source of a large loss owing to the low value of the various grades as compared to the cost of raw cotton: extreme care should, therefore, be taken in the various processes through which the cotton passes to the finished product to keep at its lowest minimum the several classes of waste, and if this is done, the results would show a saving in the net loss to the manufacturer. At the same time, it should be borne in mind that the labor loss on the several grades is considerable, particularly yarn waste, as this not only represents a loss as between its market value and the raw cotton, but the labor which has entered into it would be found in some instances nearly to wipe out any gain in the sale of this waste.

It is not possible to fix a standard as to what the gross loss should be for any mill as the several grades of cotton create a factor which must not be lost sight of. Machinery also plays an important part in the general results, and the reasons for same are generally understood by all practical mill men. Organization and good discipline also has its effect in the reduced amount of waste made about a cotton mill, and a close account should be kept of all waste sent to the waste-house of the different grades, and a regular inspection made of same by those interested.

In order to approximate the average loss to a cotton mill, or to illustrate same intelligently, we will take for example a mill using 10,000 bales per annum. The first thing to be considered regarding same is the tare per bale, on which we will allow 22 pounds, although it will probably average more; 10,000 bales with a tare of 22 pounds each, equals 220,000 pounds, with a value of not over 3/4 cent per pound, which gives a return of $1,650; and if cotton costs 10 cents per pound, the loss on each bale would be $2.03 1/2, and on 10,000 bales $20,350; any excess weight in bale covering and hoops would add to the above amount.

The gross loss in round numbers to the average weaving mill spinning medium numbers of yarns is about 15 per cent., and this figure will do for illustration.

Assuming a gross loss of 15 per cent. on 10,000 bales of 500 pounds each, or 5,000,000 pounds, it amounts to 750,000 pounds less the tare of 220,000 pounds, leaving 530,000 pounds of all other grades of waste, which, at the present price, would have a value of about 5 cents per pound, which gives a return of $26,500, or a loss on each bale of $2.65, and on 10,000 bales $26,500, with a gross loss per bale of $4.68 1/2 including the tare, or $46.850 and an actual net loss of about 14 per cent. to the mill after sale of waste at above prices.

The grades of waste which show the greatest loss in operation are the picker and card waste, the balance following in their order, beginning with the floor sweepings and yarn waste which include filling, slasher and spooler waste, and a small percentage of other grades.

In nicely running picker rooms where strict attention is given to the quality of the droppings from under beaters 25 per cent. of this waste will be cotton of good fibre and averages in staple to the cotton in the bale, but in many mills there will be found as high as 40 per cent. or more, and the difference between the highest and lowest would represent the saving of many hundred dollars per year in a mill using 10,000 or more bales of cotton. If it were possible for a mill to clean and use this cotton when spinning medium numbers of yarn it would mean a great saving, for, between the market value of this grade of waste and the cost of the raw cotton there is a wide margin.

To say this has been done successfully is only to state a fact; but in working it, care must be exercised in thoroughly cleaning the waste on a machine adapted to the purpose. It is not possible to hurry or crowd the machine and get good results. At the same time, a great deal depends on the determination of the manager with the co-operation of his carder by using good judgment in cleaning and mixing of the cleaned waste with the cotton from the bale. Running the waste through separately into laps and mixing beyond lappers on the cards has never proved a success.

The card strippings and flyings from all cards vary in quality as the cotton used varies in grade; although, where cotton is prepared for the cards in the best possible manner, the effect is noticed in a cleaner waste, and, if not used, has a higher value. Top flat strippings are composed of leaf, motes and short stock, with about 40 per cent. of the average staple which the top flats take up from cylinder by its centrifugal force and cannot be avoided without overloading the top flats. Cylinder strippings have long fibre, while from the doffer the fibre is short and of low quality. Flyings, if from the revolving top flat cards (if the card is properly adjusted), has very little fibre; although if from a common top flat card, while averaging much cleaner than the strips is shorter in length and does not show the large motes which are found in the strippings or under the licker-in, and this waste is reworked to some extent in nearly all mills.

Is it desirable to rework card waste? It would seem to be if the undesirable leaf, motes, short staple and fly could be eliminated and then mix with the raw cotton at a regular mixing, this would seem to be all that is necessary toward the successful use of this class of stock, particularly in a mill where from 1 1/8 to 1 3/8 cotton is used; the

waste from the longer staple can be used with the shorter length without difficulty if careful attention is given the matter.

The machines built for cleaning the above class of waste take out the leaf, motes and dust nicely, but they do not eliminate the short fibre and fly which is just as essential for the successful using of this grade of waste; and the only way to do this is to card same on a special card arranged for the purpose. It is this short fibre and fly that causes the mischief whenever card waste has been used. After any grade of waste has been cleaned it should be picked as little as possible before mixing, and good results would be obtained by a blending of the several grades of waste in proportion to their quality and putting same through a single section lapper with feeder attached thoroughly mixes and gives character to the waste. While it is reasonable to suppose that the above grades of waste cannot be used without jeopardizing the strength of the yarn to be spun, if special care is taken in the preparation of same by using, so far as possible, machines adapted to the purpose and not try or expect same results on machines for handling raw cotton, success would be assured many times where it has proved a failure.

Filling, slasher and spooler waste, owing to the twist in these yarns, are not as desirable a waste to use, even after they have been reduced to fibre by machines built for this class of work, as the cylinders necessarily break and injure a large per cent. of the fibre, and on account of the twist in same the finer the yarn the greater the difficulty in reducing the yarn to its original condition. This grade of stock, however, is used successfully on coarse yarns with excellent results.

Floor waste is an important item in all cotton mills and to the system and order throughout the several departments of a mill, depends either a loss or saving by attention to details in this matter. An untidy mill is always a sure indication of an extra amount of floor sweepings being made, with the consequent loss owing to the low value of this grade of waste. Clean floors and care in sorting this waste always show good results. Dirty, oily floors discolors much clean waste which comes in contact with same as it is impossible to prevent some clean waste getting on the floors owing to the many operatives employed and the variety of work in a cotton mill.

In the near future, on account of the increased consumption of the raw material and the occasional shortage of cotton, more attention will be given to the using of above waste and the utilizing of same along the lines suggested.

The only way to determine what the effect of the several grades of waste have on the strength of the yarns and their appearance is to make up small mixings which have been prepared for the purpose and run through the several processes and test the yarn. The results will be surprising to those who have never taken the trouble to do this in a systematic way. The amount of money spent by any company to economize and save by reducing its loss in waste, including the expense for machinery or detail work in connection with special reports covering this matter, is a step in the right direction.

WELFARE WORK IN THE COTTON INDUSTRY.

BY W. E. C. NAZRO, North Plymouth, Mass.

Some five years ago welfare work was started with the Plymouth Cordage Company, because it was felt that there was a great need for a more sympathetic relation between the employer and the employee. Today in our large industrial enterprises it is impossible for the executive himself to come in close touch with the employe as he did in the old days. In the desire to bring about this sympathetic relation, I was appointed by Mr. Holmes, the treasurer of the company, to take up the work that they had started in furthering the welfare of their employes.

When I went down there, the first thing that drew my attention was fixing up about the mill, the cleaning up of rubbish and tins cans, etc., to make a changed environment for those who worked about the mill. And in the establishment of welfare work it seems to me that the first point to start at is the mill in which the employe works. Consideration should be given first of all to the sanitary conditions, then to the light, then to the equipment of the factory, providing stools, if women are employed, and rest rooms where they may go when they are tired.

After leaving the mill equipped in that way, the next point in the establishment of welfare work is to go to the homes of the employes. The old type of houses with us had become unsatisfactory —that is, the old type of 8 or 10 tenements together, we felt was not appropriate to an up-to-date mill. It brought the families too near together; it did not give them any individuality, so to speak. I think you will all agree with me that in the higher scale of civilization we all seek for a home of our own; we seek for a small lot of land where we can be by ourselves and where we can develop our own individual character, not bothered by somebody at the next door on one side playing the piano or scolding some child on the other side, and so making a disturbance in the block. So we conceived the idea of putting up a two-family house with seven rooms and modern plumbing.

These houses were placed each on a lot of land about 100 feet wide and 150 feet deep, the setback from the street being about 45 feet, thus giving them lawns in front of their houses, and a vegetable garden and a place to raise poultry in the rear. After these were established we offered prizes for the gardens kept up in the best manner, for the best vegetable gardens, and for the best trees, so as to encourage this home industry

After that we made a step further to develop the sympathetic relation between the home life and that of the mill; for that, it seems to me, in our industrial enterprises of today, is one of the foremost needs—the bringing of the worker and his family into close sympathy with the work, to make him feel, when he comes away from his work at night, that those who are in command of the factory still have an interest in his welfare and are looking after it in many different ways. To attain this aim and to bring about closer relations our first step was to establish a kindergarten where we might instruct the children of our employes. When we started four years ago we had about fifteen children in the kindergarten. Today there are over 45. And, gentlemen, I think that we have

done a great deal toward establishing that relation when we can see the men come out from the mill at noon, meet their little children at the gate, take them by the hand and walk home, forgetting all about the work of the morning and passing at once into touch with their home life, taking the child home, staying for the noonday meal, talking with the wife, talking with the little child about the work it has done in the kindergarten in the morning, hearing the little stories of the squirrels that it has learned, turning his thoughts with those of the child on the beauties of the world and nature; coming back to his work refreshed through that intercourse with the home life and impressed with the idea that there is really somebody in the factory that cares for him beyond the humdrum of the business. He comes back to his work a better man, ready to enter that work with a better spirit, because he knows that he is getting a benefit from it in his home life.

Again, further, we have established cooking schools, where we teach the children of fourteen years of age to cook. We do not teach them extravagant cooking, but we teach them how to prepare the common, everyday food; to take the cheap meats and serve them in an attractive style; to take the cheaper grades of meats and develop them into soups. And also we give lessons in preparing food for the sick, and, if there is anybody sick when the lessons are going on, the children are given this food to take home to those who are so afflicted. And, gentlemen, here again we bring about that sympathetic relation between the mill and the home life.

Going further, our next step in developing the work, as we are situated near the ocean, was to take advantage of sea bathing; and we established bath houses for our employes. We began in a very small way, starting two small houses, one for the men and one for the women. At first they were somewhat afraid of the water, I think, because a good many of them had not been accustomed to it. But finally they grew to like it, and it has increased so that, while in the first year there were something like 2,600 baths taken, the second year there were 3,600, the fourth year 4,800, the fifth year 6,700, while this year we have closed the season with 8,000 baths taken among our employes. Now, what does that mean, gentlemen? It has brought about a desire for better conditions in the home. It has brought about a desire for baths. They felt better because they were clean —and in the case of many of them I guess it had been a long time since they had come in contact with water. But it has forced us to put in baths in their houses, to give them better sanitary conditions on that very account; and we are glad to do it to develop them in their work.

To go further, we have established a library for our employes. This was given by the president of the company, Mr. Loring, as a commemoration of his father, who was a former president of the company. To show the appreciation in which this library is held, we had last year, its fifth year of establishment, a circulation of 10,000 volumes among 1,500 employes and an attendance at the library, which included simply the employes, their children and wives, of 26,000 people. Now that in itself is of tremendous educational value to our men.

Again, we established a dining room. There were several men who lived too far away to walk home for their noonday meal, and it was not always convenient for them to take the cars, especially in the winter time, when the tracks were likely to be blocked, so making them late for their work.

In the establishment of welfare work one of the principles to be borne in mind is to give them something a little better than they have been accustomed to have, so as to make it an example as a matter of development of educational work, in bringing them up to a higher standard of appreciation, and the best way to do that is by example. So we fitted up this dining room as attractively as we could, placing a large open fireplace at one end of the room, and every day when it is rainy or cold in the winter, we have an open fire, and the men draw about it and smoke their pipes and talk about the different work that is going on, and enjoy life as we enjoy it in a club. We have provided food there for the men at cost. The company pays the expenses of the dining room but we provide meat and two kinds of vegetables for 10 cents, a cup of coffee for 2 cents, and pie for 3 cents, so they can buy a dinner for 15 cents, as good as any one would care to have.

Besides the kindergarten, of which I spoke, we have established classes in sloyd, basketry and other lines of manual training.

I have often been asked whether we consider this work successful. I think the results are brought out most clearly in the agricultural exhibit which we give on Labor Day. This show started five years ago in a small house of three rooms, each about 12 feet square, one given up to poultry, one to vegetables and one to handiwork. We have carried it on for five years and the interest that has been shown in the work, and the development that it has brought about among the employes through their work at home during the winter months, has expanded that fair until this year it took a tent 210 feet long and 65 feet wide to hold the products of those people. Where five years ago there were 65 birds shown, and all of them mongrel, this year there were 675 birds and not a single bird in the show that scored less than 82 per cent. The same development has occurred in the fancy work and in our agricultural department. That, it seems to me, is the key that shows us that this welfare work has brought about a great educational development in our employes. And what does it mean? It seems to me that if we believe that in our immediate families educational work means great efficiency in our children, educational work must mean more efficiency in our employes. It must mean a better product.

Up to within a few years manufacturing concerns have been giving their time to the development of machinery to bring it up to the highest point possible. But I think I can say justly that in a great many instances the human element has not been given the attention that it should to keep in pace with the development of the machinery. For instance, in our war equipment, would it be possible for those magnificent and intricate pieces of machinery, the guns, to do their execution if it was not for the men behind the guns, the men who have had the training to hit the bull's eye? And will not the like training of the men in our

mechanical establishments give us the men who can make a product that will win renown throughout the world?

In closing, gentlemen, I would like to say that the result of these efforts has shown that the wage-earner aspires to become something more than a mere machine; that there is a readiness to improve when the opportunities are offered. Therefore, is it not the duty of every captain of industry who controls the lives of men, women and children, to find some method of welfare work which can be applied to his community, to educate his employes and make better citizens of them and inspire them to higher standards? The large industrial plants and enterprises throughout the United States, controlling as they do somewhat the lives of thousands of persons, contain, if properly fostered, the seed for one of the greatest educational processes the country has ever known. They reach a vast class of people that the public schools and colleges never can reach. They may be made to implant in the younger generation a purer and higher perception of American citizenship, American life and American ideals.

ADVANTAGES OF SUPERHEATED STEAM FOR ENGINES AND DRYING.

ERNEST H. FOSTER, M. E., 111 Broadway, New York City.

It is quite proper that cotton manufacturers should give an unusual amount of attention to the question of superheated steam at this time because the subject is one which has direct bearing on both economy of operation and capacity of output, which may be said to comprise the two fundamental points of successful manufacture. The time is now ripe for such consideration, because superheating apparatus has reached such a state of perfection as to be free from the suspicion of unreliability and because there is now available sufficient information and general data derived from actual experience with this form of apparatus, not only in cotton mills, but in other industrial establishments, to justify the expectation that a considerable outlay of money might be made without risk of failure and consequential loss.

At the risk of repeating facts which may be familiar already even to many laymen, it may be well to explain what is meant by superheated steam. Steam, as ordinarily spoken of, is saturated steam which is the gas formed by the application of heat to water after the boiling point has been reached. The temperature of saturated steam depends upon the pressure; thus, for 100 pounds pressure, as in a boiler, for instance, steam when formed, would have a temperature of 337 degrees Fahrenheit; at 150 pounds pressure, steam would have a temperature of 365 degrees Fahrenheit, and so on, increasing with the pressure. Steam in this state, as is ordinarily used, is ready to condense and revert back to the state of water, with the slightest loss of heat. It is impossible to utilize steam in any way, or even to hold it in a vessel surrounded by a lower temperature without a loss of heat. Therefore, we have in steam an unstable gas which is always condensing unless heat is being supplied from an outside source.

Now it is possible after steam has been formed from water at a temperature which is fixed by nature's laws, to further increase this temperature by the application of more heat. The moment the temperature is increased beyond the saturation point, the steam is said to be superheated. In this state, it has the properties of a perfect gas and may be increased in temperature indefinitely without any increase in pressure.

The effect of the heat on the steam when the pressure is allowed to remain constant, is to increase its volume and to decrease its weight, in direct proportion to the absolute temperatures, or according to the law for perfect gases, as established by Mariotte. It is because of these new properties which superheating gives to steam that we find it beneficial to use it in this state in driving steam engines, and it is because steam may be received at any ordinary boiler pressure or even at any increased pressure and superheated in practice to any desired temperature, even up to 800 degrees Fahrenheit, without any increase in pressure, that it possesses such great advantages for drying.

The effect of using superheated steam in engines of whatever type, whether steam turbines or reciprocating engines, condensing or non-condensing, is primarily to decrease the steam consumption and consequently the amount of fuel used. This is, of course, a direct economy in the operation of a plant, and the amount of saving will vary with the character of the engine.

Engines of the most refined type such as those arranged with triple expansion cylinders and provided with ample re-heating receivers and steam jackets show a less percentage of saving than engines of simpler form, and of very much lower first cost.

A fair estimate of the amount of fuel saved in different types of engines with a moderate superheating; that is, 100 to 125 degrees Fahrenheit based on continuous operation of existing plants, would be for

Slow running, full stroke or throttling engines, including direct-acting steam pumps	40 per cent.
Simple engines, non-condensing, with medium piston speed, including compound direct acting steam pumps	20 per cent.
Compound condensing Corliss engines	10 per cent.
Triple expansion engines with steam jackets and re-heaters	6 per cent.

In practice it is found that when superheated steam is applied to the average mill plant, the saving in steam on the main engine is about the same percentage as the saving in fuel at the boiler. This would appear on first sight to be an impossibility, since of course it is true that a saving in steam does not necessarily mean a saving in fuel, because of the fact that superheating is only accomplished by the expenditure of a certain amount of fuel.

In applying superheated steam to a mill plant, it should not only be furnished to the main engine, but also to the auxiliaries, as it will be seen that they play quite an important part in the general result. In fact, the auxiliaries being usually of a type inferior to the main engine, will show a greater proportion of saving often sufficient to make the percentage of reduction in fuel consumption of the plant correspond quite closely with the reduction in feed water consumed by the main engine.

There are other advantages besides that of economizing fuel to be derived from applying superheated steam to engines, such as dryness of steam

and absence of moisture in pipes and engines; the elimination of the separator in the pipe line, also of traps and drains; the relative efficiency of engines at light loads, and increase in boiler capacity, and in the capacity of steam pipes. The engine which is frequently started and stopped is more easily handled with superheated steam and so much time is not required for warming up.

In considering objections to the use of superheated steam in engines, it will be necessary to draw a line between what may be termed highly superheated steam, as up to a temperature of 700 degrees Fahrenheit or more, and moderately superheated steam, which would not exceed 500 degrees Fahrenheit for a total temperature.

A great many installations have been made on the high superheat system and this method is very much in vogue in Europe. It cannot be denied that satisfactory results have generally been obtained, but it seems to be the opinion of those who have had most experience that as this system which usually requires the employment of a separately fired superheater which is a more or less cumbersome thing to get under way and temporarily shut down, will only show up to advantage on continuously operated plants. The losses of starting and stopping nearly offset the economies produced during the operation.

In highly superheated plants also it is necessary to make provision by special construction of the engine, as ordinary valves, such as Corliss valves or slide valves, are not found suitable for such very high temperatures. Poppet valves do, however, give very satisfactory results under these conditions, as they are of such a form as not to be distorted by heat, and do not require lubrication. It is also found desirable in highly superheated plants to provide a special form of steam distribution, by which the steam is carried through a re-heater before being admitted to the high pressure cylinder, the object being at once to temper the superheat of the live steam, and impart a degree of superheat to the high pressure exhaust. An engine of this design is relieved of the complication of steam jackets, which serves to offset in a measure the special arrangement of steam distribution. While describing this system, it may be well to call attention to a report of some very careful tests which were made of a 500 horse power cross compound condensing mill engine, at the Durham Street Weaving Co., Ltd., at Belfast, Ireland, an account of which will be found in the Engineering Record, of June 17th, 1905. This engine gave the remarkably low steam consumption of 8,585 pounds per indicated horse power per hour, and a consumption of British thermal units per indicated horse power per minute of 192.1. The temperature of the steam at the engine was about 750 degrees, and, it is interesting to note that the valves were of the piston type and that the cylinders were vertical. This is admitted to be a very good result, and the plant undoubtedly works to the satisfaction of the owners, as do many others of similar type.

We do not find these objections to moderate superheat nor do we find any others. An engine with any ordinary type of valve will take steam at 500 degrees temperature without giving trouble, and will require only the ordinary grades of mineral oils for lubrication.

It is in moderate superheating that we think the greatest field for superheated steam in engines lies; and moderate superheat is obtained quite readily by combining a superheater with a boiler in its own setting and utilizing a portion of the heat from the furnace gases to procure the superheat. This system practically makes the superheater a part of the boiler and it is handled as such, requiring no extra care or attention, and having no losses of starting and stopping which are not shared with the boiler.

Superheaters have been fitted to nearly every style of boiler which is made in this country, and are so arranged that they may be readily installed in an existing plant. The most desirable point for a superheater in a boiler setting is where the products of combustion have given off a small portion of their heat to the boiler surface but before they have passed the greatest amount of heating surface. This gives a most efficient transmission of heat to the steam and does not interfere with the efficiency of the boiler.

The use of superheated steam for drying presents a rather different phase of the question. Here it is not so much a matter of economy of fuel consumption but it is rather an increase of output which is sought, and as it is true that steam of any pressure may be superheated, it follows that exhaust steam even at atmospheric pressure or slightly above, may be passed through a superheater and raised in temperature to 600 or 700 degrees Fahrenheit.

By using steam at this high temperature, the drying process is considerably expedited. A plant of this sort has been in operation at the Merrimac mills, at Lowell, for some time. They take the exhaust steam at about five pounds pressure and heat it up to 600 degrees. We have been told that the drying of the heavy cloth is done in about one-third of the time when superheated steam is used. This means three times the output from one machine simply by the use of superheated steam. Catalogues of the European manufacturers of superheaters contain long lists of installations at cotton and woolen mills, and it is evident that the system is very well thought of abroad. It is only within the last four or five years, however, that the manufacture of superheaters has been taken up seriously in this country, and the great demand has been for the equipment of electrical power plants. Considerably over half a million horse power of superheaters are already in use. But electrical power plants have by no means monopolized this improvement, as many successful installations are to be found in other industrial plants, such as water works, sugar refineries, soap works, packing houses, carpet manufactories and a variety of others.

That cotton manufacturers are just awakening to this obvious means of increasing their profits, is evidenced by the fact that superheaters are now being installed on quite a large scale by the Lorraine Manufacturing Co., of Pawtucket, for their engines and dryers; The Fall River Iron Works, Fall River, for their engines, and also the Algonquin Printing Company of Fall River. Many others are considering the question quite seriously, and we expect to have a much larger list of installations of this character to report before the next meeting.

We cannot close our remarks without reference to one feature of a New England cotton mill, which is quite important. You have in use a great number of Manning boilers, which by their form

of construction usually give from 20 to 40 degrees superheat. This we believe to be one of the strongest arguments in favor of this type of boiler, but we should say that for the best results, this hardly goes far enough, particularly, as when long steam pipes are encountered, the whole of the superheat is liable to be lost before the engine is reached.

We think it would pay any manufacturer to look into this subject with diligence, and arrange his plant to supply steam at about 500 degrees temperature to his engine, and to use as high a temperature as the cloth will safely stand in his driers.

THE NERNST LAMP AND ITS APPLICATION TO TEXTILE ESTABLISHMENTS.

A. T. HOLBROOK, Boston, Mass.

The lamp takes its name from its inventor, Dr. Walthur Nernst, a German professor. Dr. Nernst, in searching for an incandescent filament which would burn in the open air, made various combinations of the rare earths of the "Yttrya Group," and at last hit upon a combination which was remarkably efficient and which gave a light, owing to the high temperature of its incandescent, more closely akin to sunlight than any other illuminant then discovered. Curiously enough, this filament was absolutely a non-conductor when cold, but would take current and become incandescent after it had been artificially heated.

The glower, as it has since been called was interesting from a scientific standpoint, but it remained for Mr. Geo. Westinghouse to see its commercial value and to arrange for its development along these lines. After it had been brought to his attention, Mr. Westinghouse placed the matter in the hands of several able electricians, who were devoted to experimental work under his control, and for some years the experiments started by Dr. Nernst continued.

In the early days, the lamps were lighted by means of an alcohol torch and while exceedingly interesting, were not commercially valuable. During the Pan-American Exposition, in the year 1901, the development had reached a stage which justified a considerable exhibit and the lamp created so much favorable comment from all sections of the country, that it was determined to place the lamp on the market in the condition it was in at that time. The development, however, did not stand still, and continually from that time to the present day, have improvements been made of one kind or another, and we now have a lamp which stands well in the foreground of the "World of Illumination."

In the fall of 1901, the Nernst Lamp Co. was organized, and the first lamps were manufactured in the old factory of the Westinghouse Elec. & Mfg. Co. in Pittsburg, Pa. Since then, the finished product has been shipped all over this country and the demand for Nernst lamps in Canada has been so great that a factory in Hamilton is now busily employed in supplying that market.

The Nernst lamp is distinctly an alternating-current lamp and at 220 volts gives the best results. It is suitable to use the lamp on all single and polyphase circuits, and on all frequencies from 3,000 to 16,000 alternations.

The glowers, which are composed of rare earths, are made in the form of a small rod of white porcelain like material, about 25 millimeters long and .63 of a millimeter in diameter. It was found necessary to connect these glowers electrically and mechanically to the leading-in wires by means of a platinum bead imbedded in the glower material, and after a large number of experiments, the present glower terminal which has this feature, was decided upon. The glowers as constructed by Dr. Nernst were manufactured by convolutions of platinum wire around the end of the glower and covered with a refractory paste to keep in position. This was unsatisfactory, for the glower material had a tendency to shrink away from the connection and rendered same impracticable, and the terminal, which is now in operation, takes advantage of the peculiar characteristics of the glower and the more the glower material shrinks the harder it clutches the platinum bead. The leading-in wires are of platinum, which metal it was necessary to use in order to withstand the intense heat of the glower, which operates at about 950 degrees C. These platinum wires are extended further by a wire of base metal until it reaches the connection, which is in the form of a small aluminum plug, which is inserted in the proper receptacle.

It was found that the glower required something which would prevent its tendency to run away; that is, to take more current than was originally intended, and which would very quickly render the glower useless. To obviate this difficulty, a ballast was developed, which finds its form in that of a small glass tube hermetically sealed, containing a fine iron wire surrounded by an inert gas to prevent oxidation. The ballast is connected in series with the glower, and enables the lamp to stand considerable variations in voltage. Recent tests have shown that the ballast will stand without injury a constant overload of 5 per cent. and variable overloads of monetary duration of as high as 25 per cent. Of course, were the lamp to operate at an excess voltage greater than 5 per cent. the ballast would be injured.

In order to overcome the objections to the application of outside heat to the glower by means of an alcohol torch, or other heat producing medium, an automatic heating device was developed in the form of a small porcelain tube covered with a fine platinum wire, and further protected against the heat of the glower by a refractory paste. This heater comes into circuit first, and takes current when the lamp is turned on. In order to avoid waste, it was desired that this heater be rendered inactive while the lamp was giving light, and a cut-out was made to do this work. This is manufactured in the form of an induction coil of copper wire, wound on a soft iron core, which acts as a magnet, and attracts the armature away from the point of contact, thus breaking the circuit with which the heaters are connected. This cut-out has been developed with the idea of rendering the same operative under all normal conditions, and work quietly and constantly whenever called upon to do so.

The different styles of glassware which are used with the lamp are for the purpose of properly distributing light, and the glower is operating constantly in open air.

The lamp as manufactured at present is made in sizes ranging from 25 candle power to 500 candle power, and are as follows:

The "Baby" lamp, 25 candle power, taking .25 ampere at 220 volts consumes 55 watts.

The 1-glower lamp, 50 candle power, taking .4 ampere at 220 volts consumes 88 watts.

The 2-glower lamp, 100 candle power, taking .8 ampere at 220 volts consumes 176 watts.

The 3-glower lamp, 180 candle power, taking 1.2 ampere at 220 volts consumes 264 watts.

The 4-glower lamp, 250 candle power, taking 1.6 ampere at 220 volts consumes 352 watts.

The 6-glower lamp, 500 candle power, taking 2.4 ampere at 220 volts consumes 528 watts.

Also "Baby" lamp, 25 candle power, taking .4 ampere at 110 volts consumes 44 watts.

1 glower lamp, 50 candle power, taking .8 ampere at 110 volts consumes 88 watts.

The 220 volt type of lamps may be operated on 110 volt circuits by means of a converter coil, placed directly above the lamp, and which operates as a step-up transformer, and which raises the voltage two for one. This renders the lamp suitable for all alternating currents of 110 or 220 volts.

The lamp for operation on direct current is in the hands of the engineers, and at present is not on the market. We are in hopes in the very near future to offer a direct current lamp at 220 volts 50 candle power, which will have a commercial life of approximately that of the alternating current lamp.

As an illustration of the manner in which industries grow, it is interesting to note that since the advent of the Nernst lamp, the output of platinum has been hardly equal to the demand. At the present time, the Nernst Lamp Company is the largest individual user of platinum in this country.

At the present day, the two great forms of artificial illumination are gas and electricity. Many large industries are using gas, perhaps fully alive to its many disadvantages, but willing to continue its use because "It has served us for years and why should we change now?" When we take into consideration the disadvantageous features of gas, we do not wonder why a change should be made now, but why it was not made before, and why manufacturers, otherwise keenly alive to a strenuous competition in trade, and the vital necessity of having low operating costs, should continue the use of an illuminant generally conceded to be unsuitable to the purpose. Gas is not sanitary, the open-air flame or the Welsbach gas lamp consumes oxygen needed for the use of the worker; its heat is oppressive, and from it comes particles of dirt which will quickly soil anything in its immediate proximity. To its use can be traced many troubles which render a staff of employees inefficient and the factory is subjected to losses thereby. Gas is somewhat cheaper than electricity—its one recommendation, but through the medium of the Nernst lamp even this advantage is lost and the actual cost of operation, candle power for candle power, is practically the same. The open flame or fish-tail burner consumes 5.47 cubic feet of gas per hour, and delivers 13.4 candle power; the Welsbach mantel consumes 3.75 cubic feet of gas per hour, and delivers approximately 40 candle power; the ordinary incandescent lamp consumes 50 watts per hour, and delivers 16 candle power; the 1-glower Nernst lamp consumes 88 watts per hour, and delivers 60 candle power. The comparative cost of operation of the above, with gas at an average price of $1.00 per thousand cubic feet and electricity at a manufacturing cost of four cents per thousand watt hours, would be as follows:

Fish-tail burner	$ .00547
Welsbach mantel	.00375
Incandescent lamp	.002
Nernst lamp	.00352

Electricity is flexible; it is sanitary; it does not leak; it is easily controlled. Present methods of inspection give adequate production against danger of fires, and in every way it is the superior illuminant, and it should be used unquestionably in every factory worthy of the name.

Present day electrical engineering is along the line of producing as near daylight conditions as possible, large units scientifically placed are superior to smaller and the result is that all parts of the building are equally well lighted. The individual light is giving way to the general light, just as the combinations of small trade units produce large industries, and with the same result, for the large unit is under the care and attention of competent persons at all times, and the saving in interruptions of service, and the ability of the operative to carry on his work without interference, proves the advantage conclusively. Individual low candle power units do not distribute well and the operative is frequently obliged to bring his lamp down to his work in order to produce certain results. This causes delays and breakages, which are sources of annoyance and expense.

As compared with the incandescent lamp, the Nernst lamp on color value is more perfect and the cost of operation is materially less—so much so that the Nernst lamp gives twice the illumination with the same consumption of energy. The incandescent lamp consumes from 3.1 to 3.5 watts per candle-power, while the Nernst lamp consumes 1.6 watts per candle-power.

The Nernst lamp is primarily a high candle-power, high efficiency unit. It is closely akin to the arc lamp in shape and general characteristics, but has none of the disagreeable features so closely identified with the latter—the three-glower, 200 candle power lamp being the most popular, and it is possible with these lamps to uniformly illuminate a given space at an extremely low cost both for installation and maintenance. The light is perfectly steady at all times—pure white in quality and nearer daylight than any other illuminant known. The color value is so perfect that all colors are shown under its light in their true shades. It is possible to match the most delicate shades and it is particularly suitable for colored work of all descriptions. In dye-houses it is absolutely invaluable and the fumes and gases have practically no effect upon its mechanical construction. All of the light is thrown downwards and it is possible to illuminate looms, spinning-frames, twisting machines, cone-winders, etc., in a highly satisfactory manner. Great difficulty has been experienced in securing a suitable illuminant for the inspection-room, and for that department alone, the Nernst lamp should be used if nowhere else. Imperfections in fabrics are more readily noted than with any other light and more work and better class of work can be produced if the lamps are used. In inspecting raw cotton it is possible to secure results which without the Nernst lamp could only be secured in daylight.

The lamps operate quietly and with none of the noisy clatter and jumping and flickering of light as from the alternating current arcs.

The cost of keeping the Nernst lamp in repair is practically the same as that of the arc lamp, but on account of the long life of the former it does not require attention so frequently as the latter. The arc lamps have an average life of about 150 hours and the Nernst lamps about 800 hours. Where series arc lamps are used, this advantage is more marked. In that event, it is necessary to shut down an entire bank of lamps until the entire lot is trimmed.

The various types of Nernst lamps will illuminate the following spaces satisfactorily:

6-glower lamp .....400 square feet
4-glower lamp .....300 square feet
3-glower lamp .....200 square feet

The Saco & Pettee Machine Shops in Biddeford, Me., are illuminated by 3-glower Nernst lamps hung fifteen feet from the floor and in a proportion of one lamp per square foot, and their illumination is absolutely satisfactory. The section of their mill shown in the following photograph was considered one of the most difficult sections to light on account of numerous pulleys and cross belts. Although the work is of the closest nature, it is possible to perform it in all its details without the use of one individual light.

There are few cotton mills which cannot use Nernst lamps to an advantage, for if they are not in a position to generate their own current the local lighting company will furnish same at a satisfactory figure, and as the Nernst lamp is twice as efficient as the incandescent lamp and slightly more so than the arc, particularly where useful light is concerned, the simple matter of economy makes the Nernst lamp the most desirable.

Some mills are not in a position to use Nernst lamps on account of their direct current equipment, but would like to do so in their dye-house inspection room and laboratory. To mills so situated, it is recommended that they secure a local service, for the experience of those who have done this very thing has been so marked that they are going to increase their equipment.

The Arnold Print Works at North Adams, Mass., have been using the Nernst lamp in their dye-house for nearly six months on this arrangement, and very much to their satisfaction.

The Nernst lamp is at present in general use in a great many of the largest manufacturing concerns in America, of all classes, in machine shops, in foundries, woolen mills, department stores, art galleries, and it remains for the cotton manufacturers of New England, the greatest industry in the world, and of all others the one most vitally interested in the subject of good lighting, to investigate the merits of the Nernst lamp with the view to improving its present conditions, and it is the earnest hope of the writer that this subject will receive the careful consideration of those present, for he has no hesitation in saying that the contemplated improvements once made will prove of lasting benefit and reflect credit upon all concerned.

Following is a list of the new members elected:—

Honorary Members: His Excellency, Edward C. Stokes, Trenton, N. J.; His Honor, Franklin P. Stoy, Atlantic City, N. J.

Active Members: John Ormsbee Ames, Agt. and Sec., Fletcher Mfg. Co., 47 Charles St., Providence, R. I.; Bradley C. Algeo, Asst. Director Philadelphia Textile School, Broad and Pine Streets, Philadelphia, Pa.; William S. Blakely, Prest. Jordan Mfg. Co., Chester, Pa.; Charles Ray Blake, Asst. Supt. Tremont and Suffolk Mills, Lowell, Mass.; Joseph H. Bromley, Manufacturer of Lace Curtains, Fourth and Lehigh Ave., Philadelphia, Pa.; Joseph Brierly, Supt. W. C. Plunkett & Sons' Warp Mill, Adams, Mass.; G. R. Budlong, Purchasing Agent, Union Wadding Co., Pawtucket, R. I.; Charles F. Burnham, Treas. Crefeld Waste and Batting Co. and The L. A. Lockwood Co., Saylesville, R. I.; Samuel T. Butterworth, Supt. Baltic Mills Co., Baltic, Conn.; Benjamin C. Chace, Jr., Asst. Supt. Cohannet Mill, Trenton, Mass.; Malcolm G. Chace, Pres. Naushon Mfg. Co., Valley Falls, R. I.; E. G. Chester, Prop. E. G. Chester Hosiery Co., Cedar and Huntington Sts., Philadelphia, Pa.; Augustus T. Clark, Treas. American Circular Loom Co., Chelsea, Mass.; Wm. Clark, Agt. Wm. Clark Mills. American Thread Co., Westerly, R. I.; Alfred M. Coats, Gen. Mgr. J. & P. Coats Co., Providence, R. I.; William W. Crosby, Factory Mgr. Brighton Mills, Passaic, N. J.; L. B. Cranska, Floyd Cranska Mills, Moosup, Conn.; Arthur W. Dennis, Pres. Elmwood Mills, Providence, R. I.; Jesse P. Eddy, Jr., Asst. Treas. Tillinghast Stiles Co., and Pres. and Treas. Fitch Mfg. Co., P. O. Box 1566, Providence, R. I.; John W. France, Supt. The Aberfoyle Mfg. Co., and The Galey & Lord Mfg. Co., Chester, Pa.; Lyman B. Goff, Prest. Union Wadding Co., Pawtucket, R. I.; Adam H. Groel, Supt. Clark Mile End Spool Cotton Co., East Newark, N. J.; George W. Grove, Treas. Argo Mills Co., Gloucester, N. J.; Percy Gulline, Supt. Merrimack Print Wks., Lowell, Mass.; William Halliwell, Mgr. Ingrahamville Dye Works, Pawtucket, R. I.; Maylin Hamburger, Gen. Mgr. Rockfall Mills, Rockfall, Conn., and Montgomery Mills, North Wales, Pa.; Clark W. Holcomb, Treas. Old Colony Mills, Taunton, Mass.; Robert P. Hooper, Treas. Hooper Sons Mfg. Co., 509 Arch St., Philadelphia, Pa.; P. T. Jackson, Jr., Treas. Lowell Weaving Co., Lowell, Mass.; Robert F. Kineavy, Supt. Jordon Mfg. Co., Chester, Pa.; L. A. Lockwood, Pres. Crefeld Waste and Batting Co., and The L. A. Lockwood Co., Saylesville, R. I.; Frederick R. Mason, Pres. and Treas. The Robert D. Mason Co., Pawtucket, R. I.; David H. McKinley, Prop. Phila. Thread Co., Philadelphia, Pa.; James G. Merriman, Mgr. Standard Spinning Co., Oswego, N. Y.; Almon A. Milliken, Supt. The Jackson Co., Nashua, N. H.; Charles W. Perkins, Supt. The Totokett Mfg. Co., Versailles, Conn.; William B. Plunkett, Treas. Berkshire Cotton Mfg. Co., and Greylock Mills, Adams, Mass.; Charles O. Read, Mgr. Sayles' Bleacheries, and Treas. Glenlyon Dye Works, 63 Summit St., Pawtucket, R. I.; Robert Reoch, Gen. Mgr. Cranston Print Works Co., Phenix, R. I.; Charles W. Shepard, Mgr. Rhode Island Lace Works, Drownville, R. I.; Charles S. Smith, Mgr. Smith Webbing Co., Pawtucket, R. I.; John William Smith, Gen. Mgr. T. I. Birken & Co., Chester, Pa.; W. H. Smith, Supt. American Textile Co., Pawtucket, R. I.; Antonio Spencer, Pres. Spencer Yarn Co., 441 Butler Exchange, Providence, R. I.; Alban Spooner, Pres. Beverly Underwear Co., Beverly, N. J.; William C. Taber, Treas. Whitman Mills and Pres. Beacon Mfg. Co., New Bedford, Mass.; Edward Thayer, Sec. Lebanon Mill Co., Pawtucket, R. I.; W. T. Tillar, Treas. The Ashby Cotton Mill Co., Inc.,

Emporia, Va.; W. S. Trickett, Supt. Attawaugan Co., Montville, Conn.; Harry Tunstall, Supt. Wm. Clark Mills American Thread Co., Westerly, R. I.; W. L. Turner, Pres. North American Lace Co., Eighth and Allegheny Aves., Philadelphia, Pa.; James S. Whitaker, Member of Firm, Third and Chestnut Sts., Philadelphia, Pa.; Charles W. Wood, Mills Mgr. United States Cotton Duck Corporation, 809 Continental Trust Building, Baltimore, Md.

Associate Members: Harry Gage Baker, Crompton & Knowles Loom Works, Worcester, Mass.; Harry S. Brown, Gen. Mgr. Bruce Specialty Co., 10 Postoffice Square, Boston, Mass.; Charles F. Chase, Manager Cling Surface Co., 39 Cortlandt St., New York City; H. M. Daniel, Philadelphia Manager The Mayo Mills and The Avalon Mills, 517 The Bourse, Philadelphia, Pa.; Ezra Dixon, Pres. and Treas. Dixon Lubricating Saddle Co., Bristol, R. I.; R. D. Douglas, Cop Tube Manufacturer, 402 Bay St., Fall River, Mass.; Clare H. Draper, Experimental Dept., Draper Co., Hopedale, Mass.; Albert A. Jenks, Pres. Fales & Jenks Mch. Co., Pawtucket, R. I.; Fred Moss, of Holland & Webb, Commission Merchants, 458 Broome St., New York City; Rowland N. Mackay, Agt. The George W. Stafford Co., Readville, Mass.; Charles H. Newman, Power Transmission and Conveying Mchy., 38 Dey St., New York City; James C. Potter, of Potter & Johnson Co., Pawtucket, R. I.; E. A. Rusden, Pres. Textile Machinery Co., 17 Exchange Place, Providence, R. I.; Wallace I. Stimpson, The Draper Co., Hopedale, Mass.; John K. Whittier, Supt. Kitson Mch. Shop, Lowell, Mass.; W. A. Spellissy, Dolier & Co., Yarn Commission Merchants, Mariner and Merchants' Building, Philadelphia, Pa.

"USE AND OCCUPANCY" IN STEAM BOILER INSURANCE.

Steam boiler insurance is a matter of comparatively recent date in this country. The first steam boiler contract ever written in America was written in the year 1866. At first, indemnity in case of a boiler explosion was limited to loss or damage to property and did not cover loss of life or injury to persons. It was not until 1887 that this particular form of indemnity was added.

In the forty years of the history of steam boiler insurance, there has probably been less change in the matter of policy forms and general conditions, than in any other lines of insurance. This may be accounted for by the fact that the manufacturer and steam user has paid more attention to the question of the inspection of his boiler or boilers, than he has to the matter of indemnity in case of loss. It is a common thing, in fact, to hear a steam user say that he considers the inspection feature as the only one of value in steam boiler insurance.

The enterprising manufacturer of today, however, realizes that his boilers are called upon to do greater work than in past years; that the consequent strain upon them entails the necessity of extreme watchfulness and care and that even by the exercise of such precautions and the most thorough inspection, he may meet with an appalling disaster, resulting in large property loss and the sacrifice of a number of lives entrusted to his care. Within the past few years, one has but to tax his memory slightly to recall the various occasions when boilers, in some instances new and of the most approved type, have exploded, causing loss of life and very heavy pecuniary damage.

No better illustration of the fearful havoc wrought by an exploding boiler can be presented than the recent terrible disaster at Brockton, Mass., where a factory only a few hours before full of life and work, became a mass of ruins from which were brought out some fifty dead and dying employes. Only a few days afterward an assignment was made by the factory owners, thus consummating the final act in this picture of ruin. This boiler had been recently inspected by an old established company, and yet for a cause which experts testified as almost impossible to detect, exploded with terrific force.

Realizing these facts, the Casualty Company of America, a New York institution, has developed and is now offering to the steam user an improved steam boiler policy, which is believed to meet his requirements. While not neglecting to furnish indemnity in case of loss or damage to property, and loss of life and injury to persons, it goes still further and reimburses the mill owner for his daily loss of profits and income arising out of a boiler explosion. This form of indemnity is not entirely new as applied to other lines of insurance, as for many years fire insurance companies have made a point of writing "Use and Occupancy" policies, protecting an assured in case of loss, as a result of fire.

When it is realized that the explosion of a boiler may absolutely demolish a finely equipped and prosperous mill, thus seriously crippling or possibly ruining financially a once successful manufacturer, the value of such indemnity is very apparent.

The "Use and Occupancy" contract pro-

vides not only for indemnity to the assured in case of loss by reason of the total destruction of his plant, but also in case of partial disablement, where by reason of such loss, he is unable to operate his mill to the best possible advantage.

The prudent manufacturer today neglects no reasonable opportunity to insure his property and all other risks which are now so broadly covered by insurance. The successful operation of his mill is an all-important matter, and now at comparatively small cost he can provide himself with a contract that will add this indemnity to other loss from boiler accidents. The Casualty Company of America is today, we understand, underwriting what is probably the largest steam boiler contract in the world, viz., that of the United States Steel Corporation, under which some 5,000 boilers are inspected and insured. It has a broad field of operation, and the new form of policy that it is writing is proving of much interest to manufacturers.

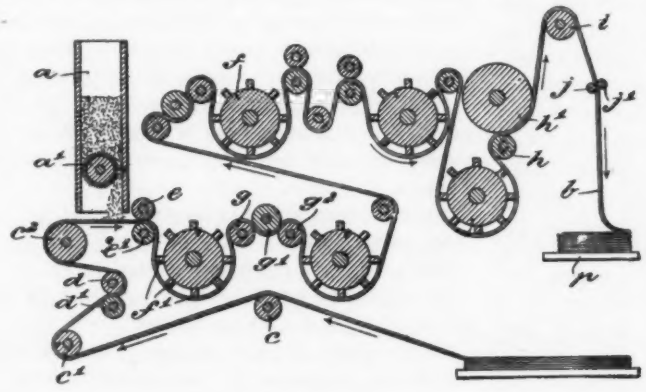


FIG. 1.

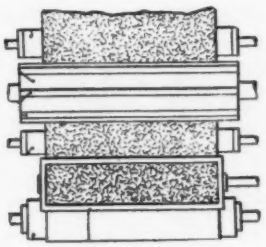


FIG. 2.

FLOCKING WOOLEN GOODS.

A machine for flocking woolen goods, recently patented in this country, is shown in the accompanying illustrations. Fig. 1 shows a longitudinal section; Fig. 2, a top view of the hopper. The flocks are placed in a hopper, a. Mounted in this hopper is a rotating bristle brush, a^1, and adjacent thereto is a toothed plate or comb, a^2, adapted normally to bear against the bristles of the brush so that the flocks may be caught up by the bristles and liberated by the intervention of the teeth of the comb and thus force the matter in a more or less finely divided state in regulated quantity on the fabric. The cloth, b, is led over tension-rolls, c, c^1, and c^2, respectively, and between pressure-rolls, d and d^1, in a longitudinal plane beneath and adjacent to the outlet of the feeding-hopper, a, whereby through the constant rotation of the brush, a^1, of the hopper, a, the flocks are deposited on the surface of the cloth.

The fabric after receiving the flocks is passed between pressure guide-rollers, e and e^1, and then in the path of a flocking-drum, f, provided with a series of transverse beater-bars, f^1. The fabric then passes over a series of staggered tension-rollers, g, g^1, and g^2 to the next flocking-drum, f, or a series of such drums in the machine, as illustrated in Fig. 1, as well as over and under tension-rolls and between pressure mashing-rolls located adjacent to the flocking-drums of the machine. By this time the fabric has the flocks thoroughly embedded in its meshes.

From the last flocking-drum, f, of the series the fabric thoroughly flocked passes between pressure-rolls, h and h^1, of different sizes to smooth out the surface of the fabric previously treated in the machine. The fabric then passes over a tension-roll, i, and between guide-rollers, j and j^1. The reason for subjecting the cloth to the action of a series of rollers is to secure an even distribution of the flocks over the surface and into the meshes of the cloth. By exerting pressure adjacent to the hopper and after deposit of the flocks on the fabric under tension such material will become packed in the meshes of the fabric by the pressure rollers and before

being acted upon by the flocking drums. Any lumps of flocks will be broken and distributed by the rollers.

LOOM AND FINISHED WEIGHTS OF WOOLEN GOODS.

BY CHAS M. HEDDLE.

There is nothing within the walls of a woolen mill that demands close attention more than the weights of goods, both from the loom and finishing department. It is by the weight that the cost is figured and the goods sold, although nominally by the yard; yet every yard must weigh a certain number of ounces. Too much care cannot be taken at the weave room perch in recording the loom weights, as the prices are based on these weights, and any excess over the weights figured on means so much loss to the manufacturer.

Once a line of goods is figured out on a certain layout, and the samples coming the desired weight, it should not be altered.

The pieces should be made exactly the same as regards layout, size of yarns, number of ends and picks, and, indeed, in every particular; so as to assure uniform weights from the loom.

With regard to finished weight it has been said, and with some justice, that there is more rule-of-thumb than science in methods often employed to arrive at certain weights. Now there should be no conjecture about such a vital matter as this. The finisher should start on a right basis and know what he wants to get. He should know by weighing the sample pieces, or ends, when they are turned over to him, and again when finished just how much shrinkage in finishing there is in every line that goes through his department each season.

If the loom weight less the shrinkage leaves the desired finished weight, there is nothing for the finisher to do so far as weight is concerned, but when there is a shortage he must make it up in the fulling mill. On certain grades of goods this weight is obtained by fulling with flocks, but the usual method is to shrink the goods lengthways, as well as in width, and by diminishing the yards increase the weight. A proper method of calculating just how much to shrink the goods in order to obtain a given weight will be best explained by an example.

Let us suppose that we are running on a 20-ounce cassimere. We have carefully weighed the sample ends or pieces in the grease and again when finished, and find that there is a shrinkage in finishing of 20 per cent. Our pieces from the loom show 23 ounces, and we are given to understand that they will come this weight right along; so it is evident that we must make up weight in order to have our goods finish 20 ounces as required, as 23 ounces (loom weight) less 20 per cent. only figure 18.4 ounces.

This difference in weight must be obtained by shrinking the goods in length, and this is accomplished by weighting the trap on the fulling mill, provided with a lever for that purpose. To arrive at the amount to be shrunk to give our weight we figure as follows:

23 oz. (loom weight) less 20%=18.4.

18.4×36 (inches to a yard)=662.4.

662.4÷20 (oz. per yard desired)=33.12.

36 inches—33.12=2.88, or nearly 3 inches per yard to be taken up in length.

Every piece should be figured separately where any variation in loom weights appear, in order to insure exact and uniform finished weights. There should be little variation in loom weights if proper care be taken in the weave room and other departments—not more than half an ounce per yard at most, and if the finisher observes much variation he should draw the attention of the responsible parties to same. While no hard and fast rule can be laid down to cover all kinds of goods, it is usually expedient to allow a little extra take-up over and above that figured on, in order to take care of any stretching the goods may receive in drying, napping and any other processes subsequent to fulling. The amount of such stretching can easily be ascertained by careful measurements before and after the processes mentioned.

There is nothing that can give more pleasure to the earnest and hard-working finisher than to see his pieces recorded in the finishing room book uniform in weight, for then he has definite assurance that his care and forethought have not been in vain, and that he is contributing in no small degree to the good repute and success of the concern that employs him.

KNITTING DEPARTMENT.

For Knitting Mill Machinery, Equipment and Supplies, see pages 232 to 253. Also Buyers' Index.

KNIT GOODS SITUATION.

The prominent feature of the knit goods business at the present time is the great demand for goods for immediate delivery. This is not so much the result of any extraordinary business having been done by either jobbers or retailers, but is due to the fact that manufacturers have not been able to get their production up as they should have during the summer months.

During a recent visit to the knit underwear districts of New York State, the writer was repeatedly informed that the labor proposition in the knitting mills is becoming a very serious one, and saw a number of instances where from one-third to a half of the machines on some of the finishing tables were idle, simply because the help could not be secured. This is certainly a serious matter when the manufacturer has orders on his books to run the mills for several months. It is not so difficult to keep operators after about October 1st, but about June 1st of each year the girls go to the mountains and lakes and take up work around resorts in order to get an outing and a change of living.

The increased cost of raw material has also been another factor that has curtailed production to some extent, particularly among the smaller manufacturers, who are not in a position to contract for the entire season's requirements at one time, and who have found it hard to pay prices recently asked for cotton and yarn.

Jobbers report a very satisfactory business so far on spring lines. No great changes in the styles of ladies' summer underwear are evident. The call is almost entirely for straight ribbed vests without sleeves or for shaped ribbed vests with long or short sleeves and for knee length lace trimmed pants, and as for color, white is the only thing mentioned.

Quite an increasing demand is noticed in men's colored under shirts in black and navy made with quarter sleeves and also sleeveless. Goods that have ordinarily sold for athletic purposes are now becoming a staple article for working people, miners and people living in the soft coal districts. Owing to this demand one of the large producers has increased the capacity of his mill and reports have it that he has booked some large orders. They may be had in grades to retail at from 25c. a garment upwards.

We also notice that a number of jobbers have included in their lines for spring, men's shirts and drawers made of nainsook. These are shown in grades beginning at 50c. a garment; the shirts are made coat shape with quarter sleeves and sleeveless and the drawers are made knee length as a rule. Those who have shown them report that a good business has been done.

The business on union suits for men, women and children is increasing. A very popular style of ladies' goods is one made by Julius Hirsh of mercerized yarn, low neck and sleeveless and trimmed at the knee with a very good quality lace. This gets to the retailer for a dollar garment.

One importer is bringing out a Swiss made combination suit of 2 by 2 rib, lace trimmed at the knee, to retail at $1.50, which has proven to be a good seller.

Zimmerli & Co. of Aarburg have changed their trimming on a number of their styles, so that their prices are from $4.00 to $8.00 a dozen less than heretofore, and they are now offering an all ribbed silk suit to retail at $6.00.

Kayser & Co. report an increasing demand for their Italian silk vests and combination suits. These are made of a flat fabric with hand embroidered yokes and the suits are lace trimmed at the knee. The vests retail at from $3.00 to $4.00 and the combination suits at from $8.00 to $12.00 each.

HOSIERY.

In regard to goods for immediate use, the situation in hosiery is not quite as acute as in

underwear, but on some lines jobbers are complaining bitterly on account of late deliveries of their early purchases. They not only have to pay stiff advances in prices, but are forced to accept late deliveries. It is not now a question of the price of cotton, but a question of the manufacturers' ability to deliver goods. We hear of some irresponsible manufacturers taking orders at advanced prices and forgetting those taken early at lower prices.

Staple goods for immediate delivery have not been so scarce in years and there are instances of small orders being turned down except for November delivery. These conditions have caused buyers to use more discretion than usual in placing further spring business. They are now placing their orders with manufacturers who they have confidence can make deliveries as specified.

The color specifications attached to late orders for spring show an increased call for white goods for both women and children, and this in the low grades from 80c. a dozen up as well as in all better numbers.

A number of buyers have already made changes in their original orders and the tan shade is suffering by the changes, buyers taking white instead and in some instances are cutting down the quantities of black ordered and adding it to white. Grays and slates promise to be fairly popular in half hose as well as ladies' goods. This is probably due to the demand for these shades for both men's and women's apparel. The indications are that men will wear white clothing and shoes next season but will wear gray half hose.

CHEMNITZ REPORT.

For years manufacturers of hosiery have not had such a busy season as the present one. The production of almost all lines has been sold up until the end of the year, and it is very difficult to get any goods delivered on short notice, so that most of the duplicate orders will not be shipped before November or December.

The prices of yarns have gone up so much recently that manufacturers had to put up the prices of the goods, as the increase was more than they could stand on their margin. Wages are also going up, owing to the fact that all factories are busy and it is only by paying higher prices that exporters are able to get goods made up quickly.

That lace hosiery was in large demand, not only for the American market, but also for all other markets has been reported before, and the craze for these goods has grown, rather than fallen off. A great many large machines are being set up, so that within six or eight weeks, the production will be larger than it is at the present time. Even that increased turn-out will hardly supply goods enough for all the deliveries that are due in December and January. There are no more $1.50 and $2.00 limit goods in the market now, but in the higher priced fine gauge goods the demand is not as large and these may still be had.

In plain staple hosiery the demand is larger than was expected and in certain gauge goods not a dozen is for sale, as the production of all machines is sold so far ahead. Buyers who have not purchased their goods early or who want to duplicate on former orders will find it a very difficult matter to get the goods at the time they need them, as well as at the old prices.

Embroidered goods are also bought freely; delays in deliveries will be unavoidable, as there is not help enough to embroider the goods after they come from the machines. No doubt plenty of new hands can be found, but as they cannot turn out as much work as experienced girls, the increase in the production will not be much larger than usual.

In solid colored goods, a decided change has taken place as to the colors that are desirable. A few months ago great quantities of rather light tans were placed, but these have now been altered. As a rule only two shades are now put in a box, one similar to last season's tan and a darker brownish shade.

More than half of the orders for tans have been countermanded and the quantities will now be taken in white, which is supposed to be the leading article for next season. Most of the buyers have also cancelled their orders for seals, while others let those stand. Light champagne colors are also ordered, but are only good for certain sections of the country, the far East, for instance.

Pink, sky and white also form an assortment which is frequently taken. The navy bought for next season is almost a plum shade, having a reddish hue. Red is also bought, but only in limited quantities.

In misses' lace hose the market is also sold up, while in men's lace half hose the demand is not up to the production, although large orders have been placed for this class of goods, mostly with small silk embroidered effects.

Jacquard fancies are selling well for men's wear, while in ladies' hose, these are only taken in the high priced goods. Striped goods have been tried by several of the importers, but only in small lots and limited numbers.

Trade in gloves is rather lively. Long gloves are not bought as much as was anticipated, but in Berlins and Milanese lisle the orders are coming in freely. While the American market is still behind in orders, England and the other European countries have bought well, so that the manufacturers can keep their plants running on full time.

HOSIERY MANUFACTURERS TO MEET IN PHILADELPHIA.

It is expected that the next meeting of the National Association of Hosiery Manufacturers will be held in Philadelphia early in November. At the time of writing the details have not yet been announced, but Philadelphia parties have the matter in hand and are working actively to bring about a successful meeting. No better place for such a convention could be selected than Philadelphia, which is the greatest hosiery manufacturing centre in the country and convenient for Pennsylvania, New York and New England manufacturers as well as those from the South.

Three hundred and sixty-five million one hundred thousand pounds of cotton yarn was imported into China in 1903, being classified according to origin as follows: Indian, 250,700,000 lbs.; Japanese, 110,800,000 lbs.; British, 2,200,000 lbs. This yarn consists of coarse counts, made from low grade Indian cotton.

PRODUCTION OF KNITTING MACHINES.

Editor Textile World Record:

Is there a method of calculating the theoretical production of a knitting machine so that by comparing it with the actual production, one may know how efficiently the machine has been operated during any given time? I am led to ask this question because of the great value of such a system in weaving, the actual production of a loom being indicated by the percentage which it bears to the theoretical production. Glasgow (589).

This inquiry raises a very interesting subject for discussion and one which was discussed in the Textile World for August and September, 1901. We republish those articles in this issue.

Following is an additional comment by the author of them, to whom the above question was submitted:

Regarding the question of production of knitting machines, if you will refer to the files of the Textile World about four years back you will find an article which I contributed entitled "Speed and Production of Knitting Machines." The expression which I use now is derived in the manner explained in the article. The production per day per cylinder per feed is equal to 127.3 divided by the cotton number of the yarn used. This expression is for a day of ten hours, and a stitch in needles of three times the gauge per one foot of yarn, and a needle velocity of 209.6 feet per minute—which is equivalent to the velocity of the needles in a 20-inch cylinder running at 40 RPM. I regard the expression as general in regard to the diameter of the cylinder because the needle velocity is the controlling speed factor, and it should, consequently, be independent of the diameter. I regard the expression as general in regard to the stitch, because in practice the variation from three times the gauge is comparatively slight. In regard to the needle velocity, that is not to be taken as general, because it varies widely according to the machine, the kind of yarn, the quality of yarn, the quality required in the stitch and the notion of the knitter or the man higher up. I believe you will find that average practice on the Crane machine will be the speed given, but the average practice on flat work would probably be 55 RPM of a 28-inch cylinder, which is also true of high-grade fleeces. On cheap fleeces 75

RPM is probably close to the average. When using the expression for these different speeds, the constant 127.3 should be changed by the ratio of the speed used to the speed given, 40 RPM. Also the constant should be multiplied by the number of feeds per cylinder.

The ratio of the actual production in pounds per day to the number obtained by dividing 127.3 by the cotton count of the yarn multiplied by the number of feeds per cylinder and reduced for speeds other than 40 is the efficiency of the knitting machine in the sense that you speak of the efficiency of the loom. I do not know of any tests to determine the efficiency of knitting machines, but should call 90 per cent. very good.

S. X.

THE BACH KNITTING MACHINES.

Manufacturers of fancy knit goods realize the necessity of adding a few novelties to their lines every year in order to meet the never ending demand for something new and keep the buyer interested in the old styles which are retained. The designing of novelties is one of the most difficult problems that confront the knit goods manufacturer, especially when his mill is equipped with machines which admit of but slight variation as regards the style of the goods. The problem is greatly simplified, however, by the Bach jacquard noppen machine, for which Max Guenther, 531 Twelfth Ave., Newark, N. J., is the American agent.

Manufacturers of sweaters, cardigans, gloves, mittens, blouses, etc., who desire to add new effects to their product are invited to correspond with Mr. Guenther, stating their requirements. He is ready to give prompt attention to such matters and is confident that he can be of great service to manufacturers by showing them the capabilities of the Bach machine. This machine, which is protected by patents, is of simple and solid construction, easy to operate and is capable of producing a comparatively unlimited number of patterns. It can be seen in operation at Mr. Guenther's address, where manufacturers can easily verify the claims made for it.

THE PRODUCTION OF CIRCULAR SPRING NEEDLE KNITTING MACHINES.

BY S. X.

It is customary to express the production in dozens of garments per day. This is a convenient way because the dozen—of No. 40 shirts—is the manufacturers' selling unit.

The production per cylinder is obtained by dividing the total daily production by the number of cylinders in the mill. This gives the commercial production, just what the manufacturer, established or prospective, wants to know, because these are figures from actual practice, and that means that all the conditions which affect the production have been taken into account.

There are a few points regarding this method of getting the prodution that should be remembered. Suppose a mill manufactures 350 dozens per day and contains 50 spring needle cylinders. The production per cylinder is seven dozens. Now suppose the mill is making 12-pound fleece goods. Then the production per cylinder is 84 pounds. This record in pounds is the rational one, because the cylinder does not produce finished garments. As a rule one cylinder makes the body cloth and a "sleever" makes the sleeves; consequently considering the shirt cylinders, where seven dozens of garments are credited to a cylinder, it actually makes nearly ten dozens of bodies and another cylinder makes the sleeves.

Again, it is assumed that seven dozens of 12-pound goods is 84 pounds, but this weight includes the cuffs which are knit on the cuff frames and should not be credited to the large cylinders. The weight of the cuffs is about .6 pounds per dozen. If this is deducted it leaves about 80 pounds per cylinder as the selling product, but actually the cylinder produced about 84 pounds, of which about four pounds has been cut to waste, while the cuffs just about make this up.

If the product of the mill is composed of piece goods, 84 pounds per cylinder would be the production. If the production is increased by 70 dozens per day, that would mean 840 pounds more, for which ten cylinders could be counted on to produce 800

pounds, and the cuff frames would knit the other 40.

The needle speed and the number of feeds per cylinder are not always alike. If they were alike the production in pounds per cylinder would be the same, regardless of the diameter of the cylinder. This seems strange to those who associate the weight of the production with the diameter of the cylinder, but it is readily realized by considering that if the needle speed is constant the yarn will run into the needles at constant speed; if the number of feeds are alike the weight of the yarn must be the same.

Other things being equal, the weight of the product is, however, proportional to the diameters of the cylinders when the cylinders make the same number of revolutions per minute, because in such a case the needle speed increases in direct proportion with the increase in the size of the cylinder. That is to say, if a 20-inch cylinder knits 100 pounds at a certain number of turns, a 15-inch cylinder making the same number of turns will knit 75 pounds. It is not practicable, however, to run a large cylinder at the same number of turns as a smaller one.

As far as the knitting is concerned, the needle speed decides the number of turns of the cylinder, and once that speed is determined the number of turns should be inversely proportional to the size of the cylinder. For instance, if a 20-inch cylinder making 60 turns has the proper needle speed for that cylinder, then a 15-inch cylinder should make $60 \times 20 \div 15$ turns, or 80 turns.

There are some knitters, however, who cannot let the logic of this overcome their prejudice against running the small cylinders fast, so they content themselves, if not their employers, by a nearly constant number of turns for all sizes. There are also those who find that under the particular conditions of their work high speed on the small cylinders is detrimental, either because of the damage done when smashes occur or for other reasons, and that being the case they are justified in not using high speed. Although this may be the situation in some mills, it is certainly not so in a large proportion of them. In some of the former it is probable that there is a little prejudice mixed up with the objections, because a number of theoretical considerations indicate that even higher needle speed may be used on small cylinders.

As the size of the cylinder decreases the number of needles engaged by the sinker burr decreases, owing to the increased curvature of the needle line, consequently the burr runs more freely in the needles and there is less tendency to overreach. Besides, there being less needles engaged, the yarn is looped into the needles with less stress. This stress on the yarn at the loop wheel is not generally appreciated. It is one of the objectionable features of the loop wheel. Every knitter knows how rapidly the sinker blades wear at the nib. This is partially owing to the concentration of the wear to one locality, but is largely due to the dragging of the yarn across the nib as the yarn enters the needles.

Before the yarn reaches the needle it lies straight across the burr spaces from one blade to the next. The entering needle presses the yarn back into the burr space, and in so doing draws the yarn over the entering blade. This needle continues to draw the yarn until the full depth of the stitch is obtained, and it has to do it against the resistance caused by the needles and blades in mesh behind it. This puts a considerable stress on the yarn.

An idea of this may be obtained by lacing a string alternately over and under the fingers of one hand, holding the fingers together slightly and then drawing the string out across the fingers. It will be observed that by pressing the fingers together to the slight extent the string may be held securely. The case of the yarn entering the needles is similar to this. If the yarn "fills the gauge" the stress is quite likely to break it, or to spring the needles back so that the proper depth of stitch cannot be obtained.

When one reflects that the yarn is sliding ahead over the sinker blades, traveling one and a half times faster than the blades, he understands how it is that they wear out so rapidly. He also understands how it is that the stress on the yarn is decreased by decreasing the number of needles past which the yarn has to be drawn a result obtained by decreasing the diameter of the cylinder. Consequently, since there is less stress on the yarn and less danger of breaking it, the

needle speed on a small cylinder may be higher than on a large one, for the same number of breaks at the burr. Another reason why the speed may be faster on a small cylinder is that the weight of the rotating parts, cylinder, take-up, roll of cloth, etc., is less than on a large cylinder.

At the present time it is customary to put more feeds on a large cylinder than on a small one. For fleece three feeds on sizes up to and including 16-inch cylinders and four feeds for a 17-inch cylinder and over is the usual rule; for flat work the ordinary range varies from four to nine feeds per cylinder. The average production per cylinder is lowered by the cylinders that are not in use; some of them are almost always stopped for one thing or another; some sizes may be ahead, repairs may be necessary, etc. The knitting machine maker would, of course, want to count out such cylinders in determining the production, but the purchaser would do well not to calculate in this way, for the idle machines are a cause of decreased production. They are some of the barnacles that keep the battleship from running up to her trial speed, but determine what speed can be counted on in battle.

The production of course depends on the length of the working day. Generally a ten-hour day is taken as the unit, but this does not mean ten hours actual production. The machine must be oiled and cleaned; stops are necessary to replace needles, tie in yarn, take out the roll, etc. The total amount of lost time depends upon a variety of circumstances. In a go-as-you-please room it may be very large. In a mill where the knitters are paid by the pound it is sure to be quite small.

So far the average commercial production has been considered. As has been stated, this is the manufacturer's figure, the basis of computation for the mill, but it has the disadvantage of being a special figure, not a general one. For instance, in the go-as-you-please mill, the average may be six dozens per cylinder per day, but this figure will not satisfy a prospective manufacturer who means to do business in a progressive way; nor will he always get the figure that he wants from an established progressive mill, for it is probably running a different gauge, on a different scale, and with other conditions different from his requirements.

The information he wants is the actual number of pounds of cloth that comes from one cylinder per day under the conditions of number of feeds, number of yarns, gauge, stitch and speed which he anticipates. Fortunately this information may be determined by anyone who chooses to figure it out. It is not necessary to depend on what some machine manufacturer says, for, although he may be honest, he may be misinformed or he may not know all the conditions.

The method of determining this production is quite simple. Suppose a thread was wound on a large, wide-faced pulley, if it were known how many yards were wound on the pulley and also how much the thread weighed per yard or per number of yards the total weight on the pulley could be determined readily. This is essentially the problem of the knitting machine, with one or two variations.

Take, for example, 28-gauge work, No. 20 yarn, 84 stitches to the foot of yarn, on a 20-inch cylinder running at 66 revolutions per minute. The circumference of the cylinder is 5.24 feet. The travel of the needles in feet per minute is 5.24 by 66, in feet per hour it is 5.24 by 66 by 60, and in feet per day of 9 1/2 hours actual time is 5.24 by 66 by 60 by 9 1/2, which equals 197,128.8, say 197,129. The yarn is No. 20, so there are 20 hanks of 840 yards to a pound. There are, therefore, 20 hanks of 2,520 feet to a pound, or 50,400 feet per pound; if the yarn were simply wound on a cylinder, we would obtain the pounds of yarn per day for one feed by dividing the needle travel in feet, 197,129, by the number of feet in a pound of yarn, 50,400; but when the yarn is looped in the needles, one foot of yarn takes up only 4.57 inches. Consequently, the number of feet traveled by the needles for each pound of yarn is 50,400 times 4.57, divided by 12, or 19,194. Since the needle travel in feet per day is 197,129, the number of pounds of yarn knit per day will be 197,129 divided by 19,194, or 10.25. This is for one thread or feed. Multiply this by four to get the production per cylinder for four feeds.

The following tables were calculated as follows: A 20-inch cylinder was taken as the

basis for the production, and the speed was assumed to be 45 turns for wool, 60 for backing cloth, double cotton face, and 66 for balbriggan. It is not to be inferred that these are given as the correct speeds or the average speeds; different circumstances require different speeds; one manufacturer believes in low, another in high and a third in moderate speed.

These figures are given as fairly representative. If they are high or low the tabulated production may be proportionately modified. Nine and one-half hours is taken as the actual running time. The backing cloth figures are obtained primarily from the weight of the face, to which 82 per cent. is added for the backing. The figures on which this table is based are taken from actual practice.

PRODUCTION OF 20-INCH SPRING NEEDLE CIRCULAR CYLINDER PER DAY.

Gauge.	Stitches per foot of yarn.	Grain, hosiery, weight in grains of 18.75 feet.	Cotton number, balbrig. gan.	Combined cotton number of face fleece	Needles per inch.	Needle space in inches occupied by 1 ft. of yarn.	Needle space in feet occupied by 1 foot of yarn.	Feet of yarn per pound.	Feet of needles per pound of yarn.	Distance in feet traveled by needles in 20-in. cylinder, 9½ hours, multiplied by 4 for 45, 60, 66 revolutions per minute.	Production.
12	42	15	..	..	7.74	5.43	45	8,750	3,938	537,642	137
14	46	12	..	..	9.08	5.07	42	10,938	4,594	.....	117
16	50	10	..	..	10.41	4.80	40	13,125	5,250	.....	102
18	55	8½	..	..	11.74	4.68	39	15,441	6,022	.....	89
18	56	..	8	..	....	4.77	40	20,160	8,064	788.515	98
20	59	6	..	..	13.06	4.52	38	21,875	8,313	537.624	65
20	62	..	10	..	....	4.75	40	25,200	10,080	788,515	78
20	61	..	..	10½	....	4.67	39	26,460	10,319	716,832	69-125
22	66	4½	..	..	14.39	4.58	38	27,611	10,492	537.624	51
22	68	..	14	..	....	4.73	39	35,280	13,759	788,515	57
22	66	..	..	12½	....	4.58	38	31,500	11,970	716,832	65-118
24	75	..	16	..	15.72	4.77	40	40,320	16,128	788,512	49
24	72	..	..	13½	....	4.58	38	34,020	12,928	716.832	55-100
26	79	..	18	..	17.05	4.64	39	45,360	17,690	788,515	45
28	84	..	20	..	18.38	4.57	38	50,400	19,152	788,515	41

The first column gives the gauge, the next four columns and their headings give particulars of the stitch, yarn and kind of fabric; the last column gives the production per cylinder, revised in the fleece cases to give the combined weight of face and back. The other columns give figures used in calculating the production, and will be of value to those desiring to make similar calculations for conditions differing from those assumed:

There are twenty-five known varieties of flax.

A KNIT GOODS DRYER.

This improved dryer as manufactured by the Johnston Novelty & Mill Specialty Co., Utica, N. Y., is designed for the purpose of drying tubular knit goods, its main object being to stretch and draw out the fabric in its tubular shape, in turn freeing the goods thus treated from all wrinkles or creases during the drying operation.

Reference will now be had to the accompanying illustrations, of which Fig. 1 is a front view of this improved dryer; Fig. 2 shows an end elevation of Fig. 1., partly in section, together with a portion of the dryer head in position therein. Fig. 3 shows a plan view of Fig. 1. Figs. 4 and 5 show details, in cross section, of certain parts of the new apparatus, required to be given to be able to hereafter explain its construction and operation.

In the illustrations, numeral of reference 1 indicates the frame of the machine, which acts as bearings for the drawing rollers 2 and 3, said frame being supported on legs or standards 4. At the one end of the shafts carrying the drawing rollers 2 and 3, and fastened thereto, are meshing gear-pinions 5, only one of which can be seen in the illustration, the other being directly underneath or in mesh with pinion 5, if

reference be had to Fig. 1. Upon either roller shaft there is fixed, at one end, an extension, and by means of which, through suitable driving power, the rollers 2 and 3 of the machine are driven in the direction indicated by the arrows; 6 indicates a shaft which is also provided with bearings in the frame of a handwheel, 12, by which it may be operated. Upon the end of the shaft 11 opposite the hand-wheel 12, is supported, by means of a stud, a pinion, 13, which acts as an intermediate and does not operate the screw shaft 11, but meshes with the pinion on the end of bottom roller 3 (not shown) and the pinion 10.

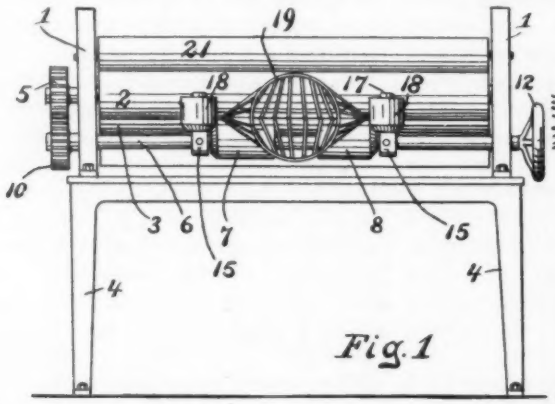


Fig. 1

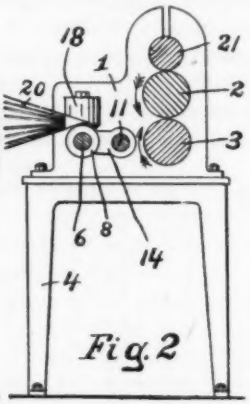


Fig. 2

the machine, said shaft being set in advance of bottom roller, 3. Near the centre of this shaft are two rollers, 7 and 8, which are held by means of a spline or key, 9, (see Fig. 4), said spline permitting the rotation of said rollers, and at the same time allowing of their lateral movement, having also at the end of its shaft a pinion, 10.

Running parallel with shaft 6 is a left and right hand-screw threaded shaft 11, mounted in bearings in the frame, being capable of easy rotation, and provided at one end with

At both sides of the screw shaft 11, is placed thereon a screw threaded guide 14, the end of its arm encircling, as a collar 15, the shaft 6. This collar 15 is provided with a set screw 16, the end of which runs in a groove at the end of the roller 8, which will be clearly seen by consulting Fig. 5. On the top of this collar 15 is an upwardly extending shaft or pinion 16, supporting a small roller 18, having at its lower end bevel-gear teeth, which mesh with bevel gear teeth on the roller 8.

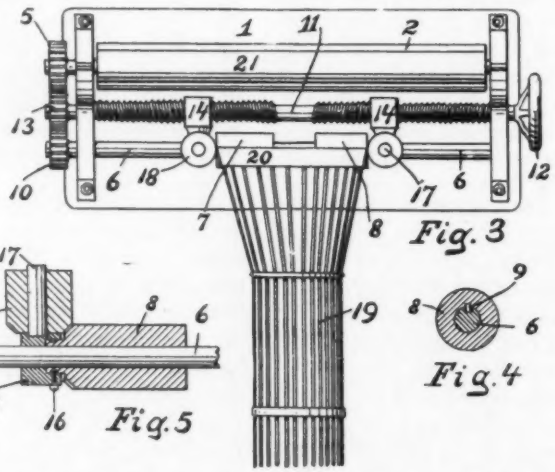


Fig. 3

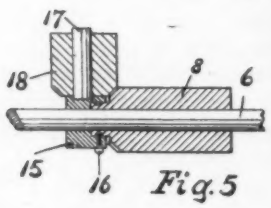


Fig. 5

Fig. 4

The drier-head 19, as constructed of wire work, is attached at one end to a drier pipe in the usual manner. The delivery end 20 of the drier head is made into the usual flat form, as seen in illustrations, and is adapted to rest centrally upon the rollers 8. It will be readily understood that the rollers 2, 3, 8 and 18 must be provided with a roughened surface, so that the goods under operation will not slip in passing through the dryer.

The operation of the machine is thus: The goods are first threaded over the dryer head of the machine, as usually done, then up to the delivery end 20, and then between the rollers 2 and 3. The rollers 8 and 18 can now be adjusted to assist the material by the corners of the drying head. After the material has passed the rollers 2 and 3, it is wound up on the cloth receiving roller 21. It will be readily seen that by turning the hand wheel 12, the rollers 8 and 18 can be set closer or further apart, to suit different widths of tubular goods, different size dryer heads being used for different size goods. Drying is done in the usual manner by means of a hot air blower, connected to the machine by means of suitable piping.

A STOCKING PRESS.

A new machine for pressing stockings, shown at Fig. 1, has recently been patented in this country and is described as follows:

In the manufacture of stockings and the like it is customary to prepare them for the market after being knitted by putting them through a heated press, by which the wrinkles are removed and the stockings smoothed down preparatory to packing and shipping them. As heretofore commonly practiced this pressing is accomplished by drawing each stocking over a board or form, which is cut to the proper shape and then inserting several such boards one at a time in an ordinary steam heated press, which is then closed down upon them for whatever time is considered necessary to complete the pressing operation.

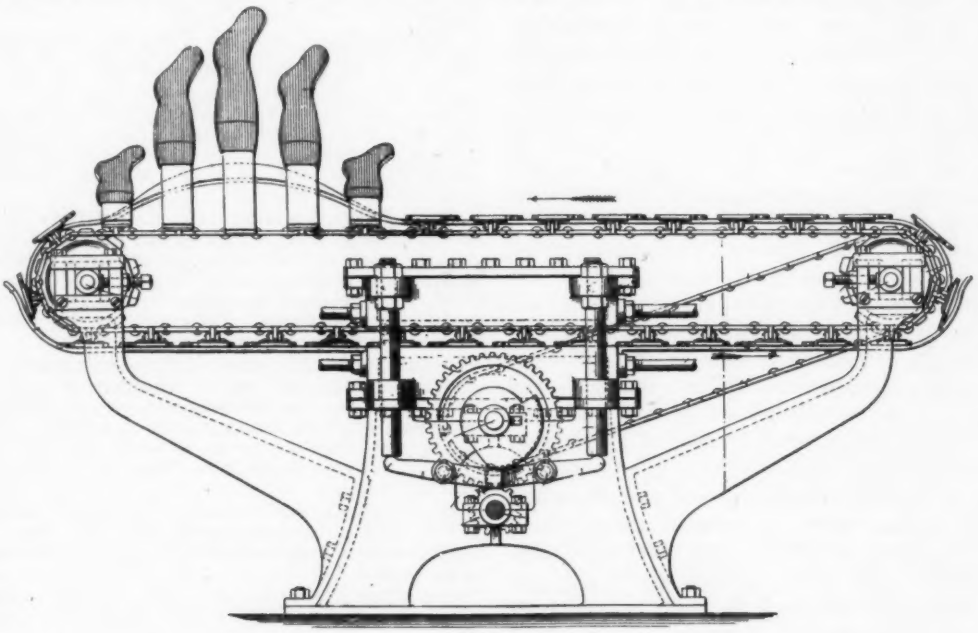


FIG. 1.

At the end of this time the press is opened and the stockings are removed one at a time as they were inserted, so that on being then drawn from the forms they possess that smoothness and shapeliness which the market demands. The present invention has in contemplation a machine for accomplish-

ing the same result automatically and by what amounts, in effect, to a continuous operation, requiring of the attendant only that he shall withdraw the pressed stockings from the forms and replace them with fresh stock.

One form of the machine is a press which opens and closes automatically and at intervals and a carrier mounted in proximity to the press and adapted to convey the stocking-carrying forms into and through the press as the latter opens and closes. The traveling carrier may be of any suitable design and construction—as, for example, a rotary part having stocking-receiving forms which radiate from it like the spokes of a wheel and which are carried through the press in succession as the carrier rotates. Preferably and as shown in the drawing, such carrier takes the form of an endless chain or belt having stocking-receiving forms which project at right angles to the path of movement of the carrier and in such relation to the press that they will be moved through the latter in turn as the carrier is moved. The press itself may have its bed and platen pivotally connected, as by a hinge, so that it opens and closes with a swinging movement, or may have its platen arranged to reciprocate bodily toward and from the bed, and in either case means are provided for opening and closing the press at regular intervals and with whatever dwell may be necessary at the times when the press is fully opened and when it is closed. The endless carrier is automatically driven so as to carry its form-boards in succession through the press, and means are provided in connection with the devices for opening and closing the press, so that the carrier automatically moves along each time the press is opened, and comes to standstill for the moment each time the press is closed.

In this manner the stockings to be finished are advanced into and pass through the press by a series of hitches or steps which will ordinarily be so proportioned with reference to the length of the press that each stocking in turn will be subjected to the closing pressure of the press more than once between its entering and leaving the press. The carrier movement causes the forms to be tilted up as they pass the attendant's station in such manner as to enable him to most conveniently remove and replace the stockings on the forms.

KNITTING MILL NEWS.

New Mills.

*Georgia, Columbus. The new buildings of the Perkins Hosiery Mills will be turned over to the machine companies this week and the work of installing the machinery will proceed as rapidly as possible. They will manufacture plain and fancy hosiery and expect to start operations about October 1.

*Massachusetts, Taunton. Operations have been started in the Taunton Knitting Mills.

Michigan, Detroit. Rindskoff Bros., of Sheboygan, are to start in business here under the name of the Cadillac Knitting Mills Co. Their mill is fitted with the latest models of German machinery and will turn out shawls, leggings, gloves and mittens.

*New Jersey, Vineland. The Karl & Levy Hosiery Company, about which reports have been previously made and which has capital stock of $50,000, is now running on ladies', men's and infants' hosiery. The plant is equipped with 71 knitting and 2 sewing machines. The product is sold direct. Use cotton yarns on cones, from 10s to 60s.

Pennsylvania, Allentown. It is reported that two new textile concerns in the shape of a knitting plant for the manufacture of fleece-lined gloves in which 24 machines will be installed, and a plant for the manufacture of Swiss embroidery, will be started up in this town within a few months.

*Pennsylvania, Mt. Carmel. The new knitting mill at this place is ready to start up. Twenty machines have been installed and more will be put in as needed.

Pennsylvania, Philadelphia. Woolen gloves are being manufactured by James Weston at 1631 Huntington Park Avenue on 11 latch and 3 spring needle knitters, the product being sold direct. He is using 2/20 woolen, 4/20 and 2/15 worsted yarns. He has plenty of orders on hand.

Pennsylvania, Philadelphia. A plant for the manufacture of women's and misses' lace hosiery has been started by M. K. Adams at 2420 Waterloo Street, where he is operating 10 Paxton & O'Neil knitters, 1 looper and 1 sewing machine. Mr. Adams reports many orders on hand for his goods and is contemplating adding many more machines within a short time. He is selling direct and through New York.

Enlargements and Improvements.

Connecticut, Waterville. The H. L. Welch Hosiery Co. are building an addition to their bleach house and also installing the necessary equipment for using their own water system.

Georgia, Montezuma. It is reported that the Montezuma Manufacturing Company contemplates increasing the output of the plant from 200 to 350 dozen suits a day.

Pennsylvania, Norristown. The Globe Knitting Mills, Rambo & Regar, Inc., proprietors, one of the largest knitting mills in the lower Schuylkill valley, are still making extensive improvements to their plant. They are now having a 60-foot addition added to their present plant, which will give them much more space on the four floors of the building. In this addition new knitting machinery will be installed, making an increase in their production of about two-fifths.

Pennsylvania, Philadelphia. W. M. Ackerman & Bro., proprietors of the Excelsior Hosiery Mills, Mascher and Oxford Sts., where they are running 125 knitters on misses' ribbed hosiery, have in contemplation the starting of a branch factory in the southern section of this city. The firm is negotiating for space in a new factory building at 514 Pine St., in which they will put 50 knitters to be operated on children's goods.

Pennsylvania, Philadelphia. Thomas D. Weston & Sons, 1115 South 15th St., manufacturers of worsted and cashmere golf gloves on eight knitting and three sewing machines, have applied for a charter under the name of the Thomas D. Weston Co., the incorporators being Thos. D. Weston, Wm. M. Field, Roland L. Taylor, W. L. Waring and Daniel F. Harrington. This business was recently started by Mr. Weston, who was formerly located in England. They are very busy and are now awaiting the arrival of several new machines from abroad. It is also their intention to remove to larger quarters as soon as they can be secured.

Pennsylvania, Philadelphia. Messrs. Lazowick Bros., proprietors of the Keystone Embroidery Works, 517-19 Lombard Street, have recently removed their plant to the new and up to date building at 514 Pine Street, where they have greatly increased the size of their plant. This concern operates 25 Bonnaz embroidery machines on hosiery. They have recently imported from Switzerland a new and recently patented machine for embroidering full fashioned hosiery which is now set up and in operation. The concern also operates 12 knitters on seamless cotton hosiery and is the only plant of this kind in the southern part of the city.

Pennsylvania, Philadelphia. Messrs. Liveright & Davidson, manufacturers of fine seamless hosiery on 50 knitters, have removed their establishment from Indiana Avenue and A Street to the northeast corner of Palethorp and Oxford Streets, where they now have more room for their operations. They are very busy. This firm was formerly known as Gans & Liveright.

Pennsylvania, Philadelphia. It is reported that the Simons & Struve Hosiery Co., manufacturers of cotton cashmere cut and seamless hosiery on 200 knitters, owing to having outgrown the buildings now occupied by them, are seeking other quarters. They are very busy.

Pennsylvania, Philadelphia. Instead of placing an order for 60 National automatic knitters, as stated in an item recently reported by us, the National Hosiery Co., just started at Sepviva and Hazzard Streets, have concluded to put in 40 more making the total number 100. The company also state that they will put in machines for the manufacture of full fashioned hosiery. Orders are beginning to come in in large quantities and the concern expects to be busy for some time to come. E. J. Aucott, one of the members of the firm, is superintendent.

*Pennsylvania, Ringtown. The Ringtown Knitting Mill will be operated at this place as a branch of the Danville Knitting Mills Co., with main office at Danville, where all buying will be done. The plant has begun operations under the new management making men's seamless half hose, with an equipment of 31 knitting machines. Seventy additional machines are to be installed.

*Pennsylvania, Schuylkill Haven. A new mill, 110 by 40 feet, 2 stories, brick, is well under way for H. Berger & Son, manufacturers of underwear. This addition will be used for finishing only. The old building will be used entirely for knitting purposes and storage. Additional machinery has been ordered.

Pennsylvania, Williamsport. The Williamsport Hosiery Co., which is making extensive improvements to the plant, is installing 50 additional knitting machines.

Rhode Island, Woonsocket. A two-story addition about 100 feet long is being built for the Rathbun Knitting Co.

Mills Starting Up.

Connecticut, Winsted. The New England Knitting Co. resumed operations last Monday after a ten-days' shut down for repairs.

*Georgia, Dalton. Operations have been started in the Dalton Knitting Mills. The company has capital stock of $10,000. W. C. Martin and R. T. Jones are interested.

New York, Waterford. The Novelty Knitting Underwear Company has resumed operations.

*New York, Waterford. Operations have been resumed in the Waterford Knitting Mill.

*Pennsylvania, Manheim. The Manheim Hosiery Mills, which were damaged some time ago by fire, have resumed partial operations. They contemplate having the plant in full working order shortly.

Pennsylvania, Montello. The branch factory of the Consolidated Knitting & Spinning Co., manufacturers of cotton seamless hosiery in Reading, which has been shut down for over a month, has again started up and is now running full time.

Mills Shutting Down.

Connecticut, New Brunswick. The Norfolk & New Brunswick Hosiery Co.'s mill is reported closed for an indefinite period.

Massachusetts, Lowell. Work will be suspended at the Lowell Hosiery Company for the next two weeks, during which time improvements will be made and new machinery added.

Rhode Island, Woonsocket. The Glenark Knitting Co. have closed for their regular summer vacation of two weeks.

Facts and Gossip.

Canada, Quebec, Waterloo. The Waterloo Knitting Mills Co. is asking for bonus of $30,000 and exemption from taxation for twenty years, in consideration for which a new factory, 200 by 80 feet, three stories, will be erected.

Kentucky, Paducah. A hosiery factory is reported to be established here by Rupert C. Aycock. Seventeen machines will be installed at first.

*Massachusetts, Lowell. F. A. Dutton, of Stoneham, who some time ago succeeded to the Waukenhose Knitting Company, has formed a new company to operate the same, called the Middlesex Knitting Mills. They will make children's ribbed hose and full regular and seamless hosiery. It is reported that the plant may be moved to Stoneham.

Massachusetts, Ware. The Ware Hosiery Company was incorporated last week with a capital of $20,000. The president of the new company, L. Philippe Deslauriers, is the owner of the Ware Hosiery Mill, making men's, women's and children's cotton and wool seamless hosiery.

New York, Johnstown. A certificate of involuntary dissolution has been filed with the Secretary of State by the Johnstown Knitting Co.

*New York, New York. The petition in bankruptcy against the Empire Knitting Company has been dismissed by Judge Holt of the United States District Court.

New York, Whitehall. Messrs. L. Fleeman & Co. of St. Johnsville and several local capitalists are interested in a new company which is to be organized for establishing a knitting plant here. A new building is to be built and equipped with new machinery. It is stated that the plant will be ready to start up about December 15th.

New York, Whitesboro. The Anchor Knitting Mills begin their winter working schedule September 5.

Pennsylvania, Columbia. The Gem Knitting Mills, owned by A. R. Kreider & Bro., have been sold to Worley Bros., Mohnsville, Pa. They will take immediate possession and enlarge and improve it.

*Pennsylvania, Mohn's Store. The Industrial Hosiery Mills of this place have two plants in operation, the one at this place being equipped with 70 latch needle knitting and 8 sewing machines, dye and finish. The branch mill is at Mohn's Hill (P. O. address, Mohn's Store), and has 50 latch needle knitttting and 7 sewing machines. Both mills are running on cotton seamless half hose.

Pennsylvania, Norristown. The following parties, J. Frank Boyer, Ned Irish, J. B. Irish, Joseph Rambo, H. K. Regar, Charles Kohler, I. Cozzens and J. Frank Wilcomb, have recently incorporated a new company under the name of the Wilcomb Machine Co., for the manufacture of knitting machinery. The capital of the company is $50,000, and they have purchased a site at Washington St. and Franklin Ave., 142 by 160 feet, where they are remodeling the two-story brick building for the purpose of building machines of this class, and expect to go into operation as soon as the alterations are completed

*Pennsylvania, Philadelphia. Hugh Wallace, proprietor of the Western Robe Co., Detroit, Mich., who recently started up the Wallace Knitting Mills at Unity and Leiper Streets, Frankford, with 12 machines for the manufacture of eiderdowns, has concluded to remove the entire plant to Detroit where the machinery will again be put in operation.

Pennsylvania, Philadelphia. It is reported that the Carvin Knitting Company are to remove from their present location to a new plant at Jasper and Cambria Streets.

Pennsylvania, Philadelphia. Mr. Joseph Weinstein, now doing a jobbing business in seamless and full fashioned hosiery at 272 South 3d Street, is looking into the matter of starting up a plant for the manufacture of hosiery. Should the matter materialize Mr. Weinstein will commence his operations on or about January 1st of the coming year under the name of the Peerless Hosiery Co.

Personals.

Arthur Seaborn is the new superintendent of the Marble City Hosiery Mills, Sylacauga, Ala.

Edward Kyland, formerly superintendent of the Fort Valley (Ga.) Knitting Mills, has become overseer of knitting of the Maline Knitting Mills, Winston-Salem, N. C.

Jacob A. Ross, who has been connected with the wholesale cotton goods firm of Boswell & Davidson, Cohoes, N. Y., for the past four years, has resigned to accept the position of superintendent of the Atlantic Mills of the Roff Underwear Co., vice William Reynolds, who will take charge of the Green Island Mills of the same concern.

Ellis N. Bedford, foreman of the seaming department of the Norfolk & New Brunswick Hosiery Co., New Brunswick, N. J., and his assistant, George N. Space, have retired. Mr. Bedford has been in the service of the company for nearly thirty-nine years. Assistant Space is another old employe of the industry, having been in its employ for thirty-two years.

Among the callers at our Philadelphia office we may mention Mr. Ferdinand Grober, Jr., who is connected with his father, a large manufacturer of woolen, worsteds and knit goods in Tubingen, Germany. Mr. Grober, who expects to be in this country until after the 1st of the coming year, is looking into the matter of manufacturing the different lines of goods here and is particularly interested in the different makes of knitting machinery, some of which they already have in operation in their mills.

Leander Hall has been made superintendent of the Lillian Knitting Mills of Albermarle, N. C.

Edwin Pickup has resumed his duties as superintendent of the Ipswich (Mass.) Mills.

Mr. Joseph J. Bodell, treasurer of the Blackstone Webbing Co., of Pawtucket, R. I., has resigned to accept a position with Baker, Ayling & Co. of Boston. Mr. Louis W. Bishop will succeed him as treasurer and manager of the New York office.

William Hurd, superintendent of the Worcester Knitting Mill, Millbury, Mass., has resigned, and is to go to Taunton as superintendent of a knitting mill. He has been in Millbury for about three years.

William Duckworth, who resigned as overseer of the Ipswich Mills, Ipswich, Mass., was presented with a purse containing a good sum of money.

Henry Garant of Knoxville, Tenn., is now with the Davis Hosiery Mills, Chattanooga, Tenn.

TEXTILE PROCESSES.

EDITED BY E. A. POSSELT.

COMBING.

(Continued from August Textile World Record.)

The essential conditions of the lap necessary to economical combing having been obtained in the ribbon lap machine, it is now taken to the comber, a machine which in its delicate construction and action upon the cotton far surpasses carding. However, although the combing process is very efficient with reference to removing short fibres and impurities the cotton still contains, the same can only be used in connection with carded cotton, thus being more or less a substitute for the second carding process as formerly extensively used, and for special yarns, in mills having no combers, to some extent still in vogue. One particular point in connection with combing is that the material must be acted upon lengthwise by the combs, since on the circumference of the comb cylinder there are about 17 combs arranged in rows, each row back of the other being finer than the one preceding it; there being in some machines 30, or more, teeth per inch in the front row and up to about 100 in the last row. The reason for this disposition of the needles in the combs is that the cotton will be treated progressively, the coarser needles preparing it for the finer ones which follow, in turn ensuring a minimum of damage to the fibres in connection with a maximum amount of cleaning.

Only small portions of the lap are treated to the combing action successively at a time. The fibres are first held at their rear ends, while their forward ends are combed out by the steel combs on the cylinder. As soon as the front ends are combed, the fibres pass forward through the machine and in doing so have their rear ends combed out by means of a comb situated at the top of the machine. In this way each fibre is combed at both ends, and all fibres below a certain length are eliminated from the long fibres, beside all the impurities still in the cotton, being extracted.

The general appearance of the machine resembles somewhat the ribbon lap machine, that is, it has six (or in some instances eight) laps fed to it at the same time, each lap being treated by a separate head, the combed laps from all the heads combining in the form of a single sliver at the coiler end of the machine. Lately combers with 10 heads have been brought into the market, the same in this instance delivering to two (2) coilers, i. e., five heads to each coiler, a feature having greater production for its object. All of the heads of one machine are connected and are driven from one end.

The lap prepared on the ribbon lap machine is placed upon corrugated wooden rollers, at the back of the comber, the same being driven directly by means of the friction between the lap and the rolls; the lap thus unwound pasing down a polished plate to the feed rolls. The revolution of these feed rolls is intermittent, and the lap is thus passed through, in short lengths, at intervals, to the nippers. When the rolls deliver the short length of lap, the nippers are open to allow it to pass through and then close upon it and hold it while the portion which was passed through is being combed by a set of combs on the cylinder coming around under the fibres and passing through them. The needles on the cylinder occupy about one-quarter of its circumference, and on the opposite side from the needles is placed a fluted segment, which comes up under the fibres after they have been combed by the cylinder combs. At the same time a leather roll descends upon the cotton, so that by the revolving contact of this leather roll (called the leather detaching roll) and the fluted segment of the cylinder, the cotton is passed forward, the nippers at this time having opened and released the back ends of the fibres. At the same time that the leather detaching roll descends upon the fluted segment of the cylinder, the top comb is brought down into the path of the fibres, and as they are passed forward, the back ends pass

through the needles of the top comb, and thus the entire length of the staple receives a thorough cleaning. The fibres thus detached and combed out are now attached to those previously combed, by means of the leather detaching roll, a steel roll and a short top roll, making a continuous combed sheet of the cotton under operation, which is condensed into the form of a sliver and passed through the draw box, with the other sliver, to the coiler can. The waste taken out by the top comb is dropped on the projecting fibres from the nippers and in turn carried away by the bottom cylinder comb, as it comes under the fibres directly afterwards. This comb is stripped of waste by a brush revolving at a quicker speed than the cylinder. A doffer then takes it off of the brush, which is in turn stripped by a vibrating comb.

The method of obtaining the several operations of the comber may be grouped into: feeding, nipping, combing, detaching and attaching, and delivering.

The feeding motion, as the name indicates, has for its object to feed the proper amount of the lap to the cylinder comb, and this at the proper time. The action of the motion is intermittent, a certain length, which is governed by the length of staple of the cotton under operation, being fed to the nipper, when the feeding motion remains stationary while the length fed is combed and detached.

A portion of the lap, after being delivered by the feed rolls, passes through the nippers, the essential use of which consists in holding the cotton fibres firmly and in such a position that they are well in range of the action of the needles composing the rows of combs fastened in the periphery of the revolving cylinder. The nippers grip the rear extremities of the fibres while the cylinder needles pass through the front portion of them. This, of course, allows only a partial combing of the entire fibre, the other portion being taken care of by another motion explained later on.

The fibres, now being held in the proper position by the nippers, are acted upon by the combs on the comber cylinder, which consists of a cast iron cylinder bolted on to the cylinder shaft, the circumference of which is divided into four parts, called respectively the "half lap" or "combing segment," the "fluted segment," the two intermediate portions being filled up with strips of tin called "tin segments." The half lap or combing segment consists of a number (generally seventeen) of brass strips running the full length of the cylinder, and having soldered on their edges rows of needles. These needles in the combs are set at an acute angle with the circumference of the cylinder, so that in moving them through the tuft of lap projecting from the nippers, they have a tendency to draw the fibres down to the base of the needles, which, being thicker at the base than at the point, form a series of V-shaped grooves which retain the bunches and neps extracted from the cotton by the needles. The first rows of combs on the cylinder are coarse, the succeeding ones gradually getting finer until the last ones, which are very delicate. The first comb has about 30 to 32 needles per inch, while the last one, as a rule, has 88 needles per inch, and in many instances as high as 100 needles per inch. This arrangement allows the fibres to receive a gradual treatment by the combs, one row in turn preparing them for the next row, a feature which in its effect is not only a great benefit to the fibres, but also saves excessive wear of the combs. Any broken needles in the combs can easily be replaced by new ones.

A detailed arrangement of the needles in cylinder comb is thus:

First six rows, 32 per inch, and 24s wire gauge.

Rows 7 to 9, 40 per inch, and 26s wire gauge.

Rows 10 and 11, 48 per inch, and 27s wire gauge.

Rows 12 and 13, 64 per inch, and 29s wire gauge.

Rows 14 and 15, 72 per inch and 30s wire gauge.

Rows 16 and 17, 88 per inch, and 33s wire gauge.

The fluted segment consists of a cast iron plate, whose surface is concentric with that of the cylinder, and is fluted or grooved along its length, parallel to the feed and detaching rolls.

The tin segments, being merely for the

purpose of filling up the portions of the cylinder, would otherwise become receptacles for dirt and fly.

The top comb consists of a flat steel plate containing a row of fine needles along its edge, bolted to two arms which are oscillated by a shaft running the length of the machine and operated by a bowl and cam.

The operation of combing is as follows:

The portion of web protruding from the nipper, and being held by the same, is on the deflection of the nipper presented to the action of the seventeen rows of needles on the cylinder, which thus comb the major part of the fibre. On the nipper resuming its normal condition, the combed fibre is lifted clear of the cylinder, and is caught between the fluted segment (which by the revolution of the cylinder is brought under it) and the leather detaching roll. Simultaneously with this action, the nipper knife ascends, thus releasing the fibres, and the top comb descends into the fibres just in front of the nipper. By this means, as the cylinder and detaching roll revolve, drawing the fibres through the top comb, their uncombed ends, which were held by the nippers, are submitted to the combing action of the needles in the top comb, thus combing the whole of the fibre.

It may be mentioned here that the front ends of the fibres are technically termed the "heads," while the rear ends are known as the "tails." Owing to the setting of the nippers, only about one-half of the length of the fibres is combed out by the cylinder comb. The extreme front ends of the "heads" of the fibres receive the greatest combing action from said cylinder combs, the amount of combing decreasing toward the nippers, for the reason that the needles do not pass entirely thoroughly through that part of the fibres close to the bite of the nippers. In order to secure the best results from the cylinder comb needles, the exact position in which the nippers hold the fibres in relation to the centre of the cylinder must be carefully considered, since provided the fibres are held too far back, it is impossible to comb all the "heads" of the fibres. "Set the needles of the comb cylinder so that if one row misses the fibres, a succeeding row will operate upon them."

In order to get the "tails" properly combed, have the top comb drop as near as possible to the detaching rollers, lifting at the same time the bite of the nippers as high as possible. It will be seen that the revolution of the cylinder comb is constant, while the combing action is intermittent, owing to the periphery of the cylinder being only partially fitted with combs. The "tails" of the fibres in being carried forward to the attaching rolls have necessarily to be pulled through the top comb, this comb acting like a filter, preventing any neps, short fibres or impurities from passing into the combed film.

Immediately after the cylinder has passed through the fibres, the latter are automatically taken forward and joined to those previously combed. To do this they must first be detached from the lap and then attached to the other combed fibres. From this it will be seen that detaching must precede attaching in the correct sequence of operations, but, however, before either operation takes place, the rear ends of the previously combed fibres must be returned a short distance in order to enable the fibres which will be detached from the lap, to overlap the ends of the fibres thus returned and be attached to them in such a manner as to produce an even film from the fibres thus treated. Directly the fibres have been returned, the detaching and attacking takes place almost simultaneously.

The attaching is performed by the same rolls as the fibres are returned by, so that an explanation of the working of the rolls will include both movements, although it must be kept in mind that detaching properly comes between them. The mechanism which actuates the rollers to return the ends of the fibres is known as the "roller motion."

There are two types of roller motions commonly used, viz., the notch wheel arrangement, as used on American machines and some English machines; and the quadrant motion, which is used principally on English makes of machines.

The combed film as coming from the detaching rolls passes into the pan situated directly in front of the rolls. The object of the pan is to keep part of the film in its full width, so that when it is returned through

the rollers for the attaching process, it will attach along the entire width. It must be kept in mind that what is said in explaining one head, applies to all heads on the machine, so that on a six head machine, there are six pans, one in front of each head. The cotton at this point in the process is in the shape of a very thin web and is very light The backward and forward movements of the attaching rolls give the web of cotton in the pan a wavery motion, and as the calender rolls in front of the trumpet have a continuous movement in the forward direction, it will be seen that if the backward movement of the attaching rolls is too far, the web will likely be broken in the pan. Owing to the fact that there is no stop motion on the machine to control such breakages, the combed cotton, when such a break occurs, collects in the pan until the machine is stopped by the operator and the broken end pieced up. As was mentioned, the web in the pan is very thin, and it is at this place where the work has to be watched to see whether the comber is working properly or not, that is, if all the neps, dirt, etc., are being properly extracted. Immediately in front of each pan is a trumpet through which the respective film passes and in turn is condensed into the form of a sliver, which is then passed through calender rollers, and from there on to the front table. This front table is a long, polished sheet of iron, about 12 inches wide and extending along the entire front of the machine, to the draw box. It is on this table that "bad piecing" shows up most prominently. Bad piecing means that the back ends of the fibres of the previously combed film were not properly joined to the front ends of the fibres of the freshly combed film, that is, the backward movement of the steel detaching roll is either too great or not great enough. In the first instance the lap will present a lumpy and uneven appearance, while in the latter case, the sliver will be continually breaking or presenting thin places in the sliver. However, the breaking of the sliver is not always an indication of bad piecing, being sometimes caused by having too great a draft between the calender rolls in front of the pan and the back roll of the draw box, a feature which consequently tends to pull the slivers apart in their passage from the calender rolls to the draw box. Guides are also placed on the table in such positions that the slivers in moving along the table will be laid side by side without any friction on each other, and in this position enter the draw box. The slivers are drawn from the calender rolls along the table by the rollers of the draw box, being guided to them by the guides.

The rolls of the draw box are composed of three sets of drawing rolls. The bottom rolls should be examined frequently to see if they are running easily and smoothly without binding or jumping. Leather covered top rolls are generally used in the draw box, care being taken to keep the front roll, which is usually a shell roll, well oiled and varnished in order to reduce the liability of the sliver sticking to the roll and causing a loss of time in cleaning it off. At the draw box, the second and last large draft on the comber is put in and the six (or more as the case may be) slivers which are fed to it from the comber heads are delivered as one sheet and then passed through a trumpet, which condenses the sheet into a compact sliver.

The total draft between the three rolls in the draw box will be about 5 or 6, so that the doubling which takes place on the front table, and the drawing which takes place in the draw box, not only make more expeditious handling of the combed slivers, but at the same time help to the production of a more uniform sliver from the comber than would otherwise be possible. Emerging from the trumpet, the sliver of combed cotton is conveyed through the block rollers, which are situated directly in front of this trumpet. The top block roll is quite heavy, while the bottom one is smaller, the former roll being constructed with a ridge running around it at the centre of its width, which fits loosely into a corresponding groove in the lower block roll. The sliver is guided into this groove and in this manner is condensed to a still greater extent.

From the block rollers the sliver is passed upwards to the coiler top and coiled into a can in exactly the same manner as on a carding engine.

Lately combers with double deliveries

have been brought into the market, the object being to reduce floor space as well as consequent cost in machinery as well as operation. The novelty consists in dividing the delivery of the series of "comber-heads" (from 6 to 10 heads being used) into two sections. The drawing rollers at the delivery end of the combing machine are correspondingly made in two sections, one-half of the delivery of slivers (say 3, 4 or 5 as the case may be) passing through each section of said drawing rollers, in turn passing through a separate trumpet and calender or delivery rollers into a separate can. This arrangement, as will be readily understood, permits an increased output as compared when using single series drawing and calender rollers in connection with one trumpet between them, and delivering in turn in one can. The whole gist of the improvement really consists in providing double the number of drawing motions (draw boxes) to a given number of comber heads delivering to it, and for which reason the speed of the comber can be considerably increased and the draft diminished, resulting in a greater production of work done without deteriorating the quality of the product.

HOUGHTON'S IMPROVED THREAD BOARD.

Among the chief points of advantage for this thread board, as manufactured by Mr. L. T. Houghton, Worcester, Mass., are found:

1st. That it completely dispenses with any wooden portions of the thread board, in turn preventing any liability to warp, providing in place thereof an entirely metal structure.

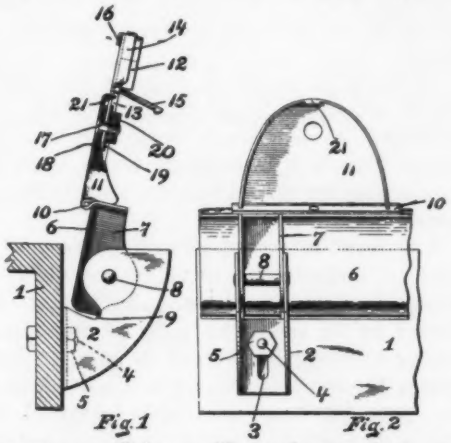
2nd. To provide suitable means for pivotally supporting the thread board rail, so that it will be partly counterbalanced, to remain up unsupported when occupying a forwardly-inclined position.

3rd. Constructing the movable parts so that they cannot be thrown back, and thereby injure the drawing rollers, or other parts of the spinning machine, etc.

4th. Having a thread guide, partly of porcelain and partly of a metal retaining finger, the purpose of the latter being to hold a thread in the notch in the porcelain, said thread guide also acting as a two-point connection between itself and finger head.

In order to give a good explanation of the construction and working of this ingenious device, the accompanying two illustrations are given, and of which Fig. 1 is a side view, parts in section, showing the thread board rail and thread guide in an elevated position. Fig. 2 shows a front view thereof.

In these illustrations, numeral of references 1 indicates the roll rail, or other part of the frame-work of a spinning or twisting machine to which the thread board is to be adjusted. Extending from the roll rail are sheet metal brackets 2, the same being slotted at 3 to receive bolts 4, which are provided with nuts 5. By means of this mode of



support, as will be readily understood, a considerable range of adjustment can be secured.

The thread board rail 6 consists of a piece of sheet metal, U or angle shaped in cross section, and which has riveted or otherwise secured to it, U or angle shaped hinge pieces 7 which fit down between the arms of the brackets 2 and are pivoted therein on rivets 8. These rivets 8, about which the thread board rail 6 turns, are situated a little distance in front of the rear edge of the thread board rail.

The top surface of the brackets 2 form stops for holding the parts in their horizontal position, and are also notched at 9 to receive the rear flange of the thread board rail 6, which also acts as a stop.

It will be readily understood that when the parts are raised, as shown in Fig. 1, the center of gravity of the thread board rail and its attachments is naturally thrown up, so as to be over or nearly over the pivots 8. If the center of gravity is thrown slightly to the rear of the pivot 8, the weight of the parts will hold them in their raised position, although in practice it has been found that the friction of the hinges is sufficient to maintain the parts in such raised position, even if their center of gravity is slightly in front of the pivotal points.

Another advantage in this thread board rail is its being supported on a self-clearing hinge—that is, when the thread board rail is raised, sufficient clearance will be left between its rear edge and the frame of the machine, to permit waste and dust to fall through without interfering with the return of the thread board rail to its horizontal position.

Secured to the front edge of the thread board rail 6 is a hinge strip 10, having ears arranged to intermesh with ears on the thread boards 11 forming the hinge joints for connecting the thread boards 11 to the thread board rails 6.

The form of thread guide employed, consists of a dovetailed piece of porcelain 12, being notched at one end to receive the thread to be spun, the sides of the thread holder 13 being bent down as at 14 to form guides for receiving the dovetailed edges of the porcelain 12, previously referred to. The body portion of holder 13 is stamped out and an arm 15 is bent down therefrom, to act as a kink arrester, at the same time acting as a stop for the rear edge of the porcelain piece 12.

Extending across the porcelain, so as to project slightly from one side thereof, is a retaining arm or finger 16, the free end of which is bent slightly upward, so that the same will serve as a guide, and at the same time permit a thread to be snapped beneath the same into the notch of the porcelain piece 12, thus retaining the thread in place.

The complete thread guide, as thus constructed, is fastened to the thread board 11 by means of screw 17, washers 18 and 19, and a nut 20, the thread guide being held from turning or twisting by means of a tongue 21,

A hole is stamped in the plate 13, through which the screw 17 passes, said hole being considerable larger than the diameter of the fastening screw. By means of this construction the thread board can be rigidly clamped into place, so that it cannot be turned or twisted.

It will be clearly seen by means of this construction of a thread guide that whenever the clamp thereof is loosened the thread guide can be moved in and out, also swung sidewise, in order to bring the same into exact position over the spindle.

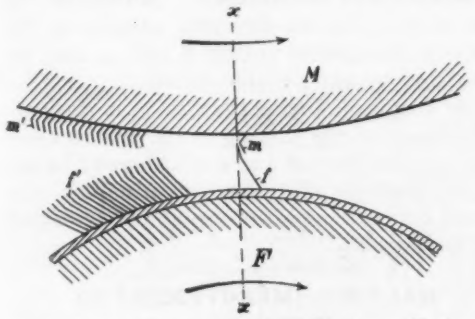
A SPECIALTY OF CARD CLOTHING FOR THE "FANCY" OF WOOLEN CARDS.

The "fancy," in a set of woolen cards is that roller, rotating with great speed, arranged (next to the last pair of worker and stripper and somewhat in front of the doffing cylinder) near to the part of the main cylinder where the fleece is removed from the cylinder by the doffing-cylinder. For the purpose of causing a very quick and complete removal of the material under operation, by means of the doffing-cylinder, the fleece has to be previously lifted to the surface of the cylinder-clothing, a feature which has to be done by the fancy, to the clothing of which the new card-clothing refers to, the other rollers of the carding engine being covered with card-clothing of usual make.

The new card-clothing differs from that hitherto used in the covering of fancies, in that the inner longer part of the carding-teeth is inclined opposite to the direction of rotation of the roller, while this outer shorter part is less inclined backward; but this outer shorter part is not bent forward enough to make it incline in the direction of rotation of the roller, but still has a slight backward inclination.

The principle of construction of the new card-clothing for the fancy, as well as the action of its teeth upon the clothing of the main cylinder of the carding engine will be readily seen from the accompanying diagram of which M indicates a portion of the main cylinder, and F indicates a portion of the

Fancy, a number of teeth m′ of the main cylinder's clothing and a series of teeth f′ of the circumference of the fancy being represented. For the purpose of minute explanation of the manner in which the teeth of both the main cylinder and the fancy, are to cooperate, single teeth m and f are shown at the part where the two rollers M and F oppose each other. The arrows shown in connection with both the main cylinder and the fancy, indicate in what direction the latter, M and F, rotate, the main cylinder M having a



much larger diameter than the fancy F; however, the latter makes a much greater number of revolutions per minute than the main cylinder M, so that the teeth f penetrating into the teeth m move faster than the teeth m.

The purpose of the teeth f is to loosen the fibres resting on the teeth m and remove them to the foremost points of the teeth m, so that they may be easily lifted off from there by means of the doffing cylinder (not shown). For the purpose of readily accomplishing this work and this in a very perfect manner, the teeth f of the fancy-roller F must be very elastic, a feature attained by bending the lower longest part, the so-called foot of the tooth backward, as indicated in the drawing, i. e., when a line x-x is drawn connecting the centres of the two rollers M and F, the inner longer part of the tooth f must be inclined very much backward in regard to this line x-x; but the front shorter point of the tooth must not have precisely the same direction as the back or inner part, but must be less inclined backward, so that its direction approaches that of the line x-x; but the size of the bend of the point toward the foot is allowed to amount only to that shown in the drawing, and it at all times must not be so great as to cause the point of the foot to be inclined forward in the direction of rotation of the fancy F, as is a feature of the tooth m, and when consequently such a position the point of the tooth f should not have.

A FRENCH IMPROVEMENT TO TWISTING AND SPINNING MACHINERY.

The same relates to twisting and spinning machines, provided with a rotating ring for twisting the threads and with a rotating cone shaped cop. It is necessary in such spinning machines that the rotating ring which guides the thread must constantly move upward and downward, the thread to be spun naturally following this up and downward movement. On account of the bobbins being of different diameters at their ends, i. e., the upper and lower part, it will consequently result in an uneven tension in winding the yarn. It will be also readily understood that if the thread is wound around the lower part of the bob-

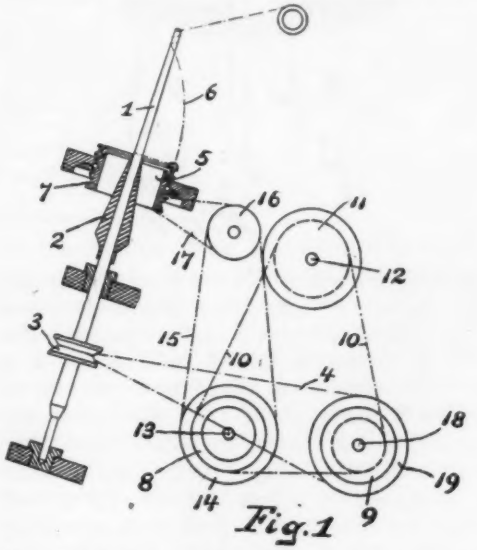


Fig. 1

bin—that is to say, the part with the greater diameter—the thread will be drawn forward with a much greater velocity than if wound upon the upper part with the smaller diameter. This difference in tension is owing to the difference in the velocity with which the thread moves forward.

It is the object of the new machine to do away with these disadvantages, this being accomplished by changing the movement of the rotating guide ring, at the same time changing the movement of the spindle itself, so that the changement in the movement of the guide ring is only half as great as in machines in which no change of movement of the spindle takes place.

Reference will now be had to the accompanying illustrations, of which Fig. 1 is partly a section and partly a diagrammatic view of the machine; Fig. 2 is a plan of the conical rollers forming the main part of the invention and of the means for shifting the belt across the same. In the illustration 1 indicates the spindle, and 2 is a conical cop situated upon the same. A pulley 3 is fastened upon the spindle 1, which drives the latter, through belt connections 4.

Five is the rotating ring, being provided with means for guiding the thread 6. To

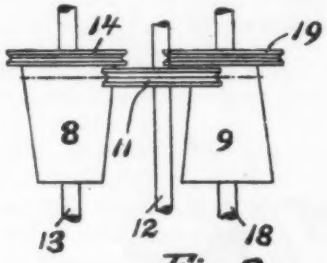


Fig. 2

this ring 6 a pulley 7 is also fixed for rotating the same. 8 and 9 are oppositely coned rollers around which a belt 10 passes. This belt 10 passes around a disk 11, which is movable parallel to the axis of the conical rollers 8 and 9. Disk 11 is situated upon a shaft 12 and is rotated by means of this shaft with uniform velocity. If the disk is moved in horizontal direction, the velocity of both conical rollers 8 and 9 is changed simultaneously, that is, the number of rotations of one of the rollers is increased, while the number of rotations of the other is diminished.

Fast to the shaft 13 is fixed a pulley 14, around which passes belt 15, which serves as a means for rotating a disk 16, the rotation of which disk is transferred by means of the belt 17 to the pulley 7. To a shaft 18 is fixed which is situated around the pulley 3. It is hereby seen that the spindle 1 is driven from the conical roller 9, whereas the ring 5 is driven from the conical roller 8. By thus a pulley 19, around which passes a belt 4, changing the number of rotations of both conical rollers in the manner described, the rotations of the spindle 1 and the ring 5 are simultaneously changed, whereby the rotation of one of these members is always increased, and the rotation of the other one simultaneously diminished. Movement to the disk 11, in the direction parallel to the axis of the conical rollers 8 and 9, may be imparted by any suitable means.

By means of moving the disk 11 in this parallel direction the shifting of the belt 10 upon the conical rollers 8 and 9 will thereby be accomplished so that the alterations in the speed for producing the cop above described are produced.

HALTON'S IMPROVEMENT TO JACQUARDS.

The gist of this improvement consists in providing means for readily throwing out of operation the devices for lifting either or both of the griff frames of a double lift Jacquard machine either independently or in connection with mechanism whereby to interrupt the reciprocation of the card cylinder.

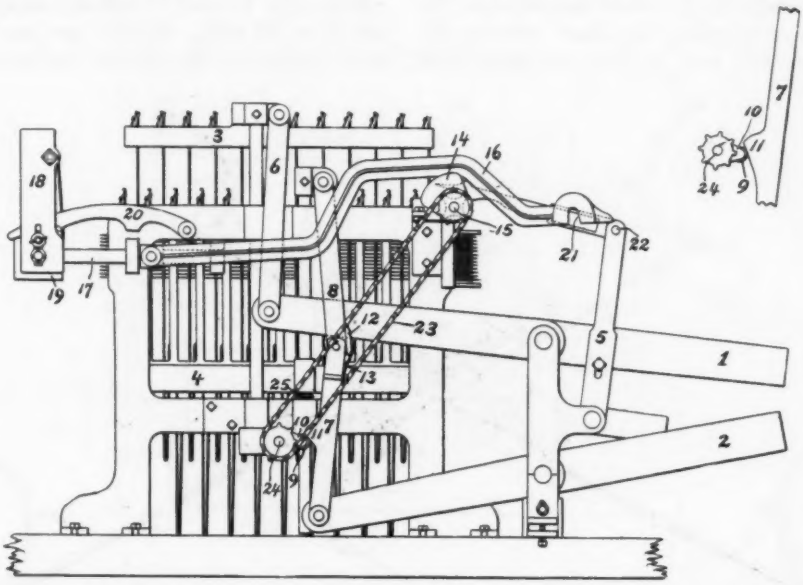
With reference to the accompanying illustration, which shows a double-lift Halton Jacquard machine in its side elevation, showing the new devices applied thereto, 1 and 2 are the two levers (reciprocated from a double crank), operating alternately griff frames, 3 and 4. A third lever, 5, is also vibrated from the driving mechanism of the loom.

MEANS FOR RAISING OR NOT ACTUATING A GRIFF FRAME.

Lever 1 is shown to act on griff frame, 3, through single lever, 6, and lever 2 on griff frame, 4, through toggle jointed lever, 7 and 8. It will be readily seen that this toggle jointed lever can be used in two ways, either normally as a single lever and thus raising its griff frame, 4, or with its joint broken (as shown partly done in the illustration), and in which instance the griff frame, 4, then is not

raised, i. e., not acted upon by levers 2, 7 and 8. This breaking of the toggle jointed lever is accomplished by means of an antifriction roller, 9, carried on crank arm, 10, coming into contact with a lug, 11, on lever link, 7. A projecting finger, 12, acted upon by a spring, 13, otherwise keeps lever links, 7 and 8, connected so as to act as a solid lever and in turn raise griff frame, 4.

A toggle jointed lever and mechanisms for operating it, as thus explained, if so desired, can be also used in place of the single lever, 6. For clearness sake we have given at the upper right hand side of the illustration, a special diagram of a portion of the lever link, 7, antifriction roller, 9, crank arm, 10, lug, 11, and the chain wheel as carried on shaft, 24.



MEANS FOR STOPPING THE RECIPROCATION OF THE CARD CYLINDER.

For this purpose cam 14, as situated on shaft 15 is provided, said cam acting at intervals upon the lower side of the bar, 16, which at one end is jointed to one of the supporting rods, 17, of the frame, 18, in which the card cylinder, 19, is mounted so as to be free to turn by means of pawl, 20, as is hung to the side frame of the Jacquard. Bar, 16, at the other end is supplied with a notch, 21, which in normal position fits over pin, 22, on lever, 5, thus imparting the turning motion to the card cylinder, 19, as previously referred to. When in turn cam, 14, comes into contact with the bar, 16, the notched end of the latter will thus be raised from contact with pin, 22 (see illustration), and in turn no motion is then imparted to the card cylinder.

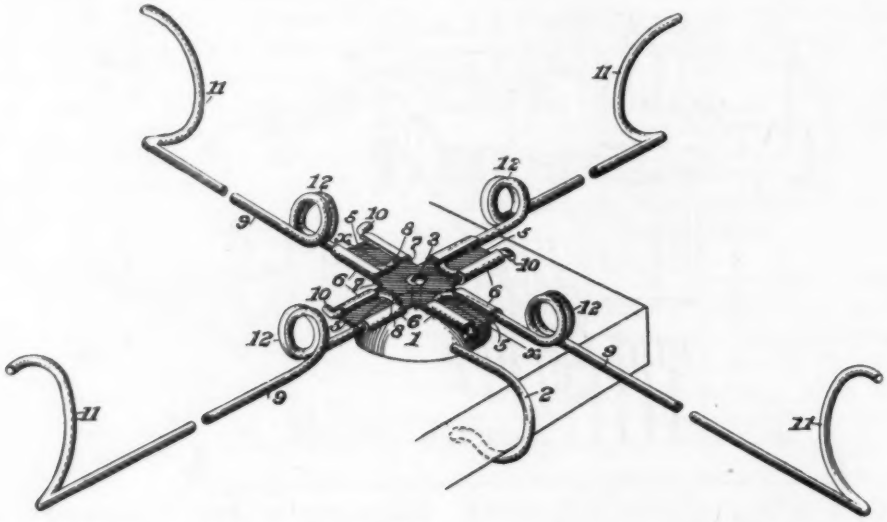
THE OPERATION OF BOTH DEVICES

thus explained, is accomplished thus: lever 5 also carries a pawl which engages a star wheel (shown by dotted lines in the illustration) secured to shaft, 15, mounted in a suitable bracket on the frame of the Jacquard machine, and which carries a chain wheel, to which is adapted a chain, 23, engaging in turn a chain wheel carried by a shaft, 24, free to turn in a bearing on the lower portion of the side frame of the Jacquard machine. Whenever, therefore, in a series of operations constituting one cycle of movement of the Jacquard machine, it is desired to lift all of the hooks controlled by the griff frame, 3, the card cylinder, 19, is held in the retracted position, as shown in the illustration, and whenever it is desired to permit all of the hooks controlled by the griff frame, 4, to remain down, the toggle connection between said frame and the lever, 2, is then bent so that the frame will not be lifted. In order to support the weight of the griff frame, 4, when the toggle connection is bent, a coiled

spring, 25, is provided, permitting slight depression of the griff frame, 4, when the connection between the same and the lever, 2, is shortened by the preliminary bending of the toggle connection under the action of the crank arm, 10.

THE "PALMA" YARN REEL.

The points of advantage claimed for this reel as compared to other makes, are the means for supporting the hank of yarn adjustably in said reel, and at the same time permitting the yarn to be easily adjusted thereto and removed therefrom if so required.



The accompanying illustration shows the new reel in its perspective view.

The same consists essentially of a stand 1, being secured to a table, or any other flat support, by means of a spring clamp 2. At the centre, and on top of the stand 1 is secured, by means of a screw 3, a plate or support 4. This plate is capable of being rotated, and is shaped in the form of a cross having arms 5, whose sides 6 are turned upwardly and inwardly to form guides 7.

The ends 8 of the yarn supporting arms 9 are V-shaped, and are sprung into the guides 7, being slightly larger than said guides, and terminate in stops 10, so that they may be sprung therein, but not passing completely through, at the same time holding the arms 9 securely in place.

In the illustration four arms are shown constituting the reel, but it will be readily understood that any number greater than one can be used to do the work.

The other ends of the arms 9 are sort of hook shaped, and it is upon and within these hooks that the hank of yarn is placed. The arms 9 are formed of suitable length to suit the sizes of hank desired, but can be somewhat extended by partially withdrawing the inner ends from their guides, and are also provided intermediate their length with the spiral portions 12, thereby permitting the arms 9 to be sprung upwardly and inwardly in order to accommodate varying sizes of hank and after the yarn has been placed thereon keep the hank taut.

In operating the reel, the same is clamped upon any suitable flat support, the arms being sprung upwardly and inwardly as much as may be necessary, and the hank of yarn placed upon the hooks. After they are released, the arms spring out and hold the hank under a tension which will be approximately the same whatever the size of the hank. The yarn may then be easily wound from the reel, which revolves freely as the yarn is drawn from it.

AN IMPROVED SILK DYEING APPARATUS.

Although this machine may be used for dyeing cotton, wool or worsted, it is, however, more particularly adapted for the dyeing of silk yarns, in the shape of skeins.

The most prominent feature in connection with this apparatus, the invention of Mr. Otto Kunz, of Vienna, Austria-Hungary, is the arrangement of laterally-swinging rods or bars which enter the skeins into the dye liquor, and cause the skeins to be swung to and fro during the process of dyeing, at the same time preventing the threads from entangling with each other, insuring in turn an even saturation of every thread of the skein with the dye liquor, with the consequent result of uniform and even dyeing.

The construction of the new apparatus is also such that the dyed skeins can be readily removed from the machine, and fresh ones inserted, by means of a special device provided for that purpose, as will be later on described.

In order to understand the proper working of this dyeing apparatus, the accompanying two illustrations are given, of which Fig. 1 is a front elevation of the apparatus, partly in section, and Fig. 2 a section taken on the line x-x of Fig. 1.

As will be seen from the illustration, 1 indicates the dye-tub, into which is put the necessary dye-liquor. At each end of the dye-tub is a stationary pillar or rod 2, which is fastened to the floor, and upon which pillars the whole working mechanism of the apparatus is mounted, said pillars and its adjacent parts being entirely separate from the dye-tub, which is capable of being removed from the machine proper.

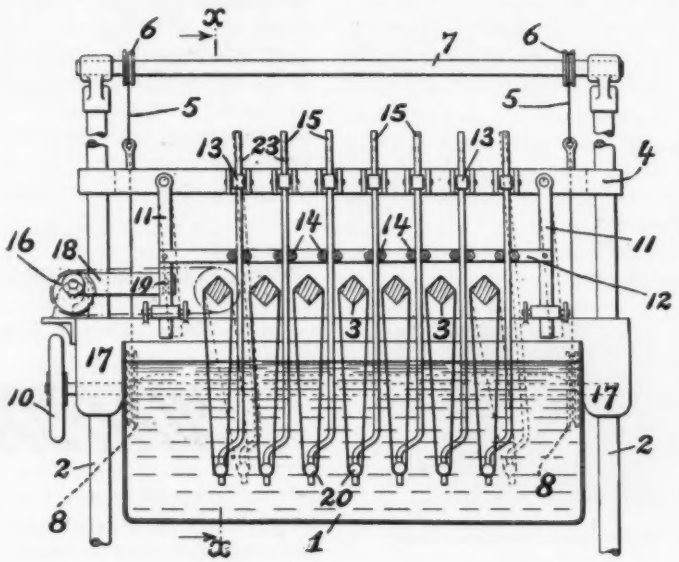


Fig. 1

3 represents rotary rollers, of ordinary construction (square in section) and upon which the skeins to be dyed are hung. The bar 4 which is mounted, and works up and down, on the pillars 2, is supported by means of chains or cords 5, which pass over small pulleys 6, said pulleys being mounted on a shaft 7, supported by means of bearings in brackets on the top ends of the pillars 2.

The other ends of the chains are secured to large pulleys 8, mounted on the shaft 9, provided at one end with a hand wheel 10.

Bar 4 has near both its ends, pendent arms 11, said arms carrying at their centres a bar 12. Bars 4 and 12 are fitted with small rollers 13 and 14, the purpose of which is to guide and at the same time allow of easy to

and fro movement of bars 15, the latter movement being accomplished by means of an eccentric 16, fastened onto one end of the frame 17 and having its arm 18 engage with a pin 19 on one of the pendent arms 11. To the lower ends of bars 15 are fastened small rods or rollers 20, which enter the skeins and are carried by the bars 15 in such a manner, so that each skein, when let down into the dye-tub, is under the direct influence of the weight of rod 20, and bar 15.

Upon the shaft 9 are mounted pinions 21, which mesh with racks 22, fastened to the backs of the pillars 2. Bar 4 is also provided

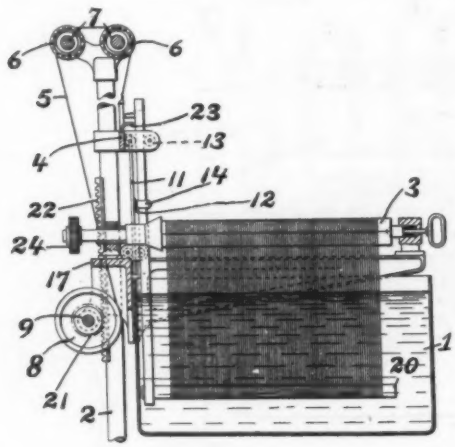


Fig. 2

with small pins or projection 23, which correspond with projections on the bars 15, to prevent the latter from sliding out of their bearings or guide rollers when no skeins are on the rollers. The skein carrying rollers 3 are also mounted in bars supported on the frame 17.

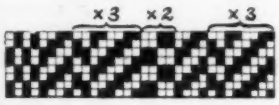
It will be readily seen that when the hand wheel 10 is turned in a right hand direction, the pinions, which are in engagement with the racks 22 will raise the frame 17, which carries the rollers 3, and at the same time the pulleys 8 will raise the bar 4 carrying the bars 15 and rods 20, but with more speed than the former, in turn bringing the rollers 3 and rods 20 close to each other, thereby greatly facilitating the putting of the skeins on the rollers.

After skeins have been pushed over the rollers 3, the hand-wheel is turned in the opposite direction and the whole apparatus let down into the dye-liquor until the skeins are sufficiently deeply immersed. When in this position the rods 20 and bars 15 will impart sufficient tension to keep the yarn taut without any danger of breaking the skeins. The machine can now be started and operated, by any suitable driving power, through gear 24, which will revolve the rollers 3, and at the same time, through belt or chain connection, drive the eccentric 16, imparting the characteristic to and fro motion to rod 12.

On completion of the dyeing operation the hand-wheel 10 must again be turned to raise the apparatus with its dyed skeins from the liquor, after which they are removed, and the same operation repeated.

NOVELTIES FROM FOREIGN SOURCES.

Woolen Cheviot Trousering.



Complete Weave. Repeat 68×4.

Warp:—2180 ends, 8 harness fancy draw.

Reed:—15½×2=70 inches wide in loom.

Dress:—

3 ends,	3 run black woolen cheviot yarn	=	3 ends
1 end,	2 fold 2/52's worsted, white	=	1 end
1 end,	2 ply, 5½ run woolen cheviot yarn, dark gray and white, twist	× 6 =	12 ends
1 end,	2 ply 5½ run woolen cheviot yarn, black and light gray, twist		
2 ends,	3 run black woolen cheviot yarn	=	2 ends
1 end,	2 ply 5½ run woolen cheviot yarn, black and light gray, twist	× 6 =	12 ends
1 end,	2 ply 5½ run woolen cheviot yarn, dark gray and white		
1 end,	2 ply 5½ run woolen cheviot yarn, black and light gray, twist	=	1 end
1 end,	3 run woolen cheviot yarn, black	=	1 end
8 ends,	2 ply 5½ run woolen cheviot yarn, black and white, twist	=	8 ends
1 end,	3 run black woolen cheviot yarn	=	1 end
1 end,	2 ply 5½ run woolen cheviot yarn, dark gray and white, twist	× 5 =	10 ends
1 end,	2 ply 5½ run woolen cheviot yarn, black and light gray		
1 end,	2 ply 5½ run woolen cheviot yarn, dark gray and white, twist	=	1 end
2 ends,	3 run black woolen cheviot yarn	=	2 ends
1 end,	2 ply 5½ run woolen cheviot yarn, black and light gray, twist	× 6 =	12 ends
1 end,	2 ply 5½ run woolen cheviot yarn, dark gray and white, twist		
1 end,	2 ply 5½ run woolen cheviot yarn, black and light gray, twist	=	1 end
1 end,	2 fold 2/52's worsted, white	=	1 end
		Repeat of pattern:	68 ends

Filling:—45 picks per inch, all 3 run woolen cheviot yarn, black.

Finish:—Cheviot finish, 56 inches wide.

FACE FINISHED WOOLEN GOODS.

The continual change in fashion, in a corresponding way puts continually new demands upon the finisher, and which on account of keen competition in the market he must promptly meet or the mill he works for will lose trade. How far and in what manner the finisher may be successful in increasing the value, and improving the appearance of a piece of cloth, will form the subject of this article. Certainly all efforts of a finisher to produce a certain finish required are waste on his part, provided the general layout, or, in other words, construction of the fabric, is wrong.

For example, the kind of wool used may have been entirely wrong for the finish required, again the same may have been treated entirely wrong in the scouring, dyeing, carding or spinning operations. Wool of a dead, dull appearance, whether naturally so or caused by faulty scouring, etc., will in the finished fabric never assume the fine gloss required, and all endeavors of the finisher to produce this lustre artificially will be waste of labor and time on his part.

Another most important item which must be taken into consideration is the setting of the warp, i. e., its texture, and which for producing a full face must be correspondingly close. Again, carding and spinning must have been done with the knowledge of the finish required, since, for example, too much or too little twist in warp or filling may be the entire cause of a faulty finish to the fabric, no matter how much pains the finisher may take with the goods.

The amount of twist per inch in the yarn will influence the fulling properties of the fabric, and it is upon the fulling, milling or felting of the structure that the perfect final finish largely depends.

For instance, a fabric which cannot be fulled sufficiently will never assume an elegant finish. The face of the cloth will appear open, and the necessary smoothness wanting. A good compact fulling is indispensable for a fine and elegant face finish. However, at the same time, fulling must not be overdone, since this will make a hard and board-like cloth. See to it that the cloth in the process of fulling is always kept sufficiently moist and supplied with plenty of soap, since if letting the cloth under fulling run dry the same will heat up more than good for it, with the result that the cloth will become looser in feel, as well as rough and bristly, a defect that cannot afterwards be corrected entirely, even by the greatest amount of care on the part of the finisher.

While heavy weights, when finished, as a rule, require a soft and pliable feel, light and medium weights generally require a firmer and heavier fulling. When the cloth after fulling has been thoroughly scoured, it is entered into the gig and handled there with fairly well-worn teasels, receiving several—usually two—passages. The common up and down two contact gig is generally used for this operation, because the attendant can more readily assist where necessary—for instance, by opening a rolled-up selvage, or drawing out creases and folds, etc. This first gigging has for its purpose the loosening of the entangled nap covering the face, and to lay it in such a way that after drying, it can be clipped in the next operation of shearing, i. e., cropping.

The drying of the cloth after the first gigging must be carefully attended to, so that the cloth is stretched perfectly smooth. If this is not well done, creases and cockles may be formed, and which in the subsequent shearing would be cropped bare at the projecting places. The treatment of the pieces in the first gigging requires the greatest care. Too sharp teasels must not be used as they are apt to tear out the felt thereby producing a defective and threadbare surface. For the same reason the cloth must neither be shorn too low at the cropping. Only the upper nap or felt is to be roughened at the first gigging and shorn at the cropping, so that in the final gigging, to which in turn the fabric is then subjected, the teasels will work easier and more thoroughly into the bottom felt of the structure and in turn loosen and smooth it more readily.

After the drying or cropping of the fulled pieces, it is advisable to inspect them thoroughly as regards cleanness, quality and compactness of felt, feel, etc. The experienced textile worker can render great assistance

here in certain cases, by applying the proper remedies, which, if the goods were advanced into the subsequent stages of their finishing, could no longer be made use of. Pieces that are not entirely clean, as well as those with defective closeness of nap and feel, are best well washed again with soap, and afterwards with fuller's earth. Pieces which have become a little too firm and stiff should be treated longer than usually done, with a stiff solution of fuller's earth, which makes them looser in feel.

While hard and strongly felted cloths, such as plain broadcloths, etc., are with advantage more energetically treated with a thick solution of fuller's earth, those pieces with a less felted surface—as, for instance, heavy weights produced by means of a backing filling, are treated less energetically and with a more diluted fuller's earth solution, since by the exposure to a treatment with a thick solution a good many fibres are ground off from the surface and washed away. After the treatment with fuller's earth the pieces are slightly whizzed in the hydro-extractor, and then set aside for gigging.

Heavy weights, like beavers, kerseys, coatings, as well as heavy weight doeskins, etc., are as a rule first gigged upon the back. As this kind of goods does not become sufficiently soft by being gigged only upon the face—and great stress is laid upon a soft, agreeable feel, in the finished cloth—it becomes necessary to gig the back more or less, and which is best performed before gigging the face; whereas those pieces which have already become somewhat soft and pliable by the first (preliminary) gigging can be more readily smoothed and stretched by gigging the face only in the second (actual) process of gigging.

If the cloth contains creases and cockles, then, of course, even the strongest gigging on the back will help but very little, which also applies to plain cloths that are not gigged on the back. It becomes then necessary to previously smooth such pieces, which is done, by what is known as the (old fashioned) boiling process in the following manner: The pieces are whizzed in the hydro-extractor and then tentered and dried, in which operation they must be stretched sufficiently both in length and width so as to smooth out the creases and cockles. They are then wrapped upon perforated copper (steaming) rollers in order to facilitate the entrance of the water into the interior so that the pieces will sink more quickly. The pieces are wrapped as tightly as possible and the roller, with the cloth, is laid over night in water from 100 to 110 degrees F. The cloth is then taken out left upon the roller from six to eight hours to cool and then unwrapped after which it is submitted to gigging. Water of a temperature higher than 110 degrees F., however, must not be used, because the cloth becomes then hard and brittle, will gig with difficulty, and show a lean face. At a temperature from 100 to 110 degrees F. this manipulation has practically no influence upon the appearance and feel of the cloth, but it becomes smoother thereby and will gig more nicely and uniformly, so that it is worth the trouble. With heavy weights it is best to let the gigging of the back precede the process of tentering, as the cloth can then be more readily stretched in its width, so that the cockles and creases will smooth out more easily.

As regards the water to be used in the above described processes, soft water will make the cloth much softer than hard water. If, however, the finisher has only the latter at his disposal, it is well to boil it for thirty minutes, with the addition of a little bran, and then let it cool to the necessary temperature, or, better yet, simply add Wyandotte textile soda to the hard water, which procedure will at once remedy the trouble. Water which has been used several times for the purpose is better than fresh water, since any objectionable components are precipitated by the repeated heatings.

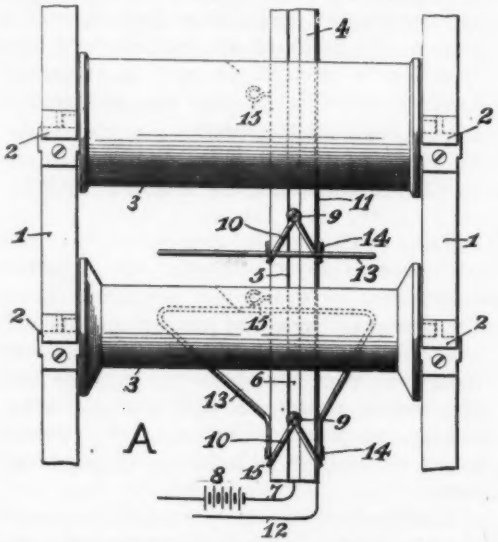
BORCHER'S ELECTRICAL STOP MOTION FOR WARPERS.

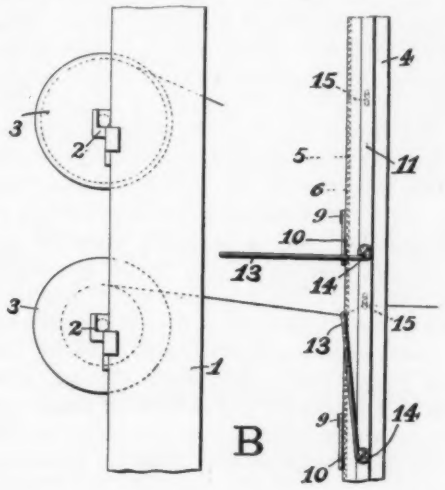
This electrical stop motion, the invention of Mr. R. C. Borchers, the well known textile engineer of Philadelphia, has for its object to stop the warper to which it is applied upon breakage of any of the warp threads, the running out of spools, etc., this being effected by the making of an electrical circuit, which occurs whenever anyone of the warp threads

are broken or run out. This circuit closer may be adopted in connection with any of the known type of devices, in which the closing of an electric circuit stops the machine.

In order to describe the stop motion properly, the accompanying illustrations are given, of which A represents in front elevation a portion of a section of a creel of a warping-machine with the new circuit closers attached, and B the same portion of the creel in its side elevation.

In the illustrations 1 indicates the uprights of the creel and which are provided with





proper bearings 2, which carry the spools 3. In front of each vertical row of spools there is mounted a vertical wooden rail 4, the face of which is directed toward the spools, and has a vertical groove 5 cut into it. At the bottom of this groove is attached a strip of copper tape 6, one end of which is in connection with a wire 7 and a battery 8, interposed within the electrical circuit, and by means of which the stop motion is operated. Along the face of strip 6, at certain distances apart, are inserted screws 9, which are in electrical connection with the strip 6, and carry the bifurcated steel stop-wires 10. These stop-wires are bent at their centres to form an eye, their ends diverging, as clearly seen in diagram A. They are pivoted upon the screw or pivot 9, being capable of swinging from side to side, and are at all times in electrical contact with the strip 6. To one side of the rail 4 is attached another strip 11, of copper tape, the lower end thereof connecting with the wire 12, consequently being also brought into the electrical circuit previously mentioned. The drop wire 13 of the stop motion has both ends terminating into eyes, being secured in corresponding position to the stop wires 10 by means of screws 14 to the rail, the drop wire being capable of up and down movement on its pivots.

It will be seen that the lower ends of the arms of these drop wires are bent parallel to each other, so as to loosely fit the rail, at the same time the space between these parallel ends being smaller than the distance between the lower ends of the bifurcated stop wires 10. Eyes 15 are fastened to the side of the rail 4, their purpose being to guide the yarn from the spools, at the same time putting enough tension, on the yarn to told the drop wires upright.

The operation of the motion.

As long as the yarn is unbroken, the drop wires 13 will be in their vertical position (see a), but upon the breaking of a thread said wires 13 will drop to a horizontal position (see b), in turn closing the circuit between the strips 6 and 12, thereby actuating the stop motion mechanism, and consequently stopping the machine. It will be readily understood that the circuit is arranged in mul-

tiple arc so that no matter how many circuit-closers and spools are used or how they are arranged, they will all operate in connection with one stop motion.

A GERMAN PROCESS OF MANUFACTURING SIZE FOR COTTON YARN.

The inventor of the new process, W. Moller-Holtkamp, of Munchen-Gladbach, claims that up to the present day the manufacture of size, as is carried on in cotton mills, is not perfect, for the fact that continually new recipes for size and size admixture are introduced into the market at high prices; but that the size produced by their means is generally in the form of a creamy, lumpy kind, for the reason that it contains too much farina (potato flour) in an undissolved state in it.

The inventor of the new process in turn also claims that such trouble is overcome by his process, i. e., a perfectly faultless size being obtained by putting 15 lbs. farina into from 10 to 15 liters (1 liter=1.76 pints) of cold water. The mass is then made uniform by continuously stirring it and crushing any little lumps that might have formed, after which it is poured into a bath of about 150 liters of water (taking into consideration the 10 or 15 liters previously used in dissolving the 15 pounds of farina) and brought to boiling temperature by the admission of steam in it while being constantly stirred. This mixture gradually becomes so thick that a further stirring of the same will be found impossible.

At this moment a solution of about 400 to 500 grams (1 gram=15.432 grains) of 10 per cent. chlorid of lime, with about 5 or 6 liters of water, is added, and the bath allowed to thoroughly boil. In seven or nine minutes after the chlorid of lime has been added and the mass itself well stirred, the latter becomes a thin fluid, clear as water, in which state it may be used at a temperature of from 50 degrees to 60 degrees C.=(122 to 140 degrees F.) for sizing purposes.

The watery solution of chlorid of lime, which consists of caustic lime Ca (OH_2), chlorid of calcium ($CaCl_2$), and calcium hypochlorite, Ca (OCl_2), has a double effect upon the starch (farina).

Chlorid of lime and chlorid of calcium produce a mechanical solution of the starch, and calcium hypochlorite, a very powerful agent in oxidation, effects a change from starch to sugar and finally to gluconic acid. A solution of chlorid of lime can only be partly substituted by caustic potash or sodium hydrate, as the latter two only effect a solution of the starch and not a change into gluconic acid.

If yarn is treated with this size, it will be completely impregnated on account of the thin liquid state of the size, and as the starch is entirely dissolved no traces of any remaining undissolved particles on the surface of the yarn are to be found, the yarn in turn being superior in strength to such as treated by another recipe, for the fact that not the least part of the flour is wasted.

THE SOUNDNESS OF WOOL FIBRES.

This characteristic quality of the wool fibre means their strength. It is readily ascertained by drawing a few fibres out of the fleece and grasping each singly by both ends, pulling them until they break. Examining such fractured fibres by a very powerful microscope, shows that such fractures occurred at the point of juction of the various scales, which have pulled from amongst each other.

If finding a great many weak fibres in a lot of wool this may or may not be objectionable to its use, since the percentage of weak fibres found and the purpose of the yarn to be manufactured out of the lot of wool in question must be taken into consideration. If the yarn is destined for woolen warp yarn or for combing purposes, strength is absolutely necessary to produce a perfect yarn.

The cause of the weakness in wool fibre is usually improper nourishment of the sheep, which may be caused by sickness or scarcity of food. The sorter often finds a fleece of wool illustrating in a remarkable manner the effect of ill health of the sheep. He knows it almost by instinct; there is something in the feel, an absence of life and elasticity, which betrays it.

A closer examination will reveal an irregularity unmistakable, and will show even whether the indisposition was temporary, re-

current or continuous. If the first, a true line of demarcation will show plainly across the staple; the fibre at this point will be thinner, less elastic and weaker, also of a different color; and here the breakage is sure to occur. The return of health will cause a healthy addition to the staple, and another interruption by sickness will show another fault. Constant sickness will produce a staple weak and diseased throughout. A sick sheep is liable to be found in any flock, and may be expected, though such cases are usually isolated ones; but in case of deficiency of feed, the whole flock is affected, and for this reason the buyer is careful to satisfy himself before purchasing.

The climate also affects the wool, as severe winters make the wool coarser and irregular, and the undergrowth of short wool is more noticeable. Constant wetting and drying make it tender, the brilliancy and lustre are lost, and the fibre is dry and dead, owing to the continual washing away of its usual protector, the natural oil, which coats the fibre in healthy sheep under normal conditions.

The wool of sickly or murrian sheep is generally not only finer than in a healthy sheep of the same breed, but it possesses this tender quality, not to be detected by the eye, nor even by the microscope; unless that it may be suspected by a slighter degree of polish, and not having so full and round an appearance.

Age has often much effect in deteriorating the fleece. The yolk lessens in quantity after the sheep, and especially the ewe, is six years old; and, to the decrease of the yolk, there soon follows a hard, inelastic, unyielding, character of the wool that renders it useless for several purposes for which the younger, and especially the wether-wool is sought—"it dies in the bowl"—it sinks in the water in which it is washed, and acquired there a shriveled and dead-like appearance. It is difficult to spin, and it materially injures the fabric in which it is employed.

The wool often becomes considerably injured by felting while it is on the sheep's back. This is principally seen in the heavy breeds, especially those that are neglected and half-starved. It generally begins in the winter season, when the coat has been completely saturated with wet; and it increases until shearing time, unless the cot separates from the wool beneath and drops off. The cotting of wool is only an injurious extension of the process of felting—the wool forms into a hard, thick knot that can scarcely ever be unraveled. Some breeds are more subject than others to this defect.

Wool is sometimes injured by keeping for a long time in its grease. It will probably increase a little in weight for a few months, especially if kept in a damp place; but after that it will somewhat rapidly become lighter, until a very considerable loss will often be sustained. This, however, is not the worst of the case; for, except very great care is taken, the moth may get into the bundle and injure and destroy the staple; and that which remains untouched by them will become considerably harsher and less pliable.

The tests made as to the strength of the various wool fibres show that the strength of the fibres generally follows the diameter, i. e., the larger the diameter the greater the breaking strain required.

MOISTURE-PROOF BOBBINS.

A method of treating wooden bobbins to make them moisture proof has recently been patented in this country and is described by the inventor as follows: Wooden bobbins have been treated in various ways to prevent the moisture to which they are constantly subjected from entering the pores and swelling the bobbins, with a shrinkage of the same when permitted to dry out. This shrinking and swelling not only affects the fit of the bobbin on the spindle, it being sometimes too tight a fit and at other times too loose, but it also has a very decided tendency to split the wood, rendering the bobbin worthless. Hot grease has been used to fill the pores of the wood, waterproof enamel has been applied, and still another method employed is to soak the bobbins in oil and then to apply a coat of shellac. In the course of experiments to make such bobbins still more repellant to moisture in a simple and inexpensive way it has been discovered that extremely good results are obtained by first thoroughly soak-

ing the bobbin in very thin shellac and thereafter applying a final coat or surfacing of thick shellac.

The bobbins are immersed in a bath of very thin shellac—say of about the consistency of water—and allowed to soak till the air has been practically driven out of the pores of the wood and its place taken by the shellac. The thoroughly-impregnated bobbins are then removed from the bath, the surplus shellac being allowed to drip off, and when the bobbins are dry they are given a final coating or surfacing of thick shellac possessing considerable body. This coating is applied in any suitable manner, conveniently by dipping. Such final coating when dry forms a hard, smooth surface or skin extending unbrokenly over the entire surface of the bobbin, presenting no projections or rough portions on which the yarn may catch, and effectually preventing the access of moisture to the bobbin. Should this external coating crack, the thin shellac which has filled and hardened in the pores prevents the entrance of moisture to the bottom, so that its size remains constant and a uniform fit on the spindle is secured.

The bath in which the bobbins are soaked must be very thin shellac, in order that the pores may be thoroughly impregnated or filled to avoid the formation of merely a thin surface skin.

AN IMPROVED METHOD OF OILING LIFTER RODS.

This construction of a spinning frame has been devised to facilitate the oiling of the lifter rods. It is the subject of a recent patent and the inventor states that in addition to the ease in oiling it prevents lint and dust from entering the bearings. The lifter rods are generally supported in bearings in the front rails of the machine and are reciprocated through the bearings by the lifter-arms, which in turn are operated by the builder motion to reciprocate the ring-rail by the lifter-rods in the usual way. As heretofore constructed the bearings for the lifter-rods are usually vertical holes in the front rails used without oil, thereby causing friction and requiring increased power to run the machine. If oil were inadvertently used in these bearings, lint from the machine would collect on the oiled rods, clog up the bearings, causing them to bind, and prevent the accurate reciprocating movement of the ring-rail.

The improvement consists in the construction of the bearings for the lifter-rods, an oil-well connecting the bearings, and adjustable cone-shaped caps on the bearings, whereby the bearings are kept properly oiled and free from lint or other foreign substances.

Fig. 1 is a front view of part of a spinning-frame, showing a lifter-rod provided with improved bearings and oiling device; Fig. 2 is a vertical sectional view, showing the construc-

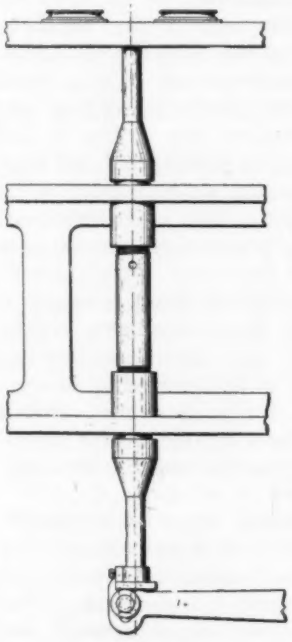


FIG. 1.

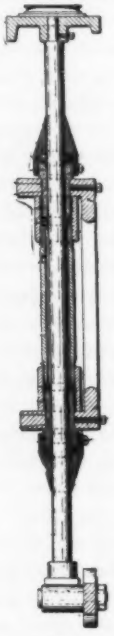


FIG. 2.

tion of the bearings, the oil-well connecting the bearings, and the cone-shaped caps on the bearings.

The bearings (e e) each have a vertical bore for the lifter-rod and the enlarged screw-threaded head, in the end of which is the depression for the packing-ring. The bearings extend through the holes in the front rails, in which they are secured by the set-bolts, as shown in Fig. 2.

The caps each have a cone-shaped top, in

which is a hole for the lifter-rod and the inner surface bearing on the packing-ring. The caps are adjustably secured to the bearings by screwing them on the heads, and held in the adjusted position by the set-screws. The cone top of the caps extends outward from the bearings and closely fits the lifter-rod, forming a knife-edge for scraping off lint or other foreign substances which may collect on the rod.

The oil-well consists of a tube, surrounding the lifter-rod and having an oil-hole and screw-threaded ends. The tube is held in position between the front rails by the screw-threaded sleeves, which are in engagement with the ends of the tube and are supported in position by the inner ends of the bearings, which extend into them, as shown in Fig. 2.

The felt packing-rings are each held between the depression in the bearings and the inner surface of the caps and prevent lint or other foreign substances from entering the bearings; the felt oiling-rings are each held between the inner ends of the bearings and the ends of the tube.

MEASURING CLOTH IN THE LOOM.

A device for measuring warp on the beam, and indirectly the cloth woven is shown in the accompanying illustration.

Referring to Fig. 1, (a) designates the warp, which has been beamed with the indicating and measuring warp (a′) which, as shown, is represented as the first at one side, the entire series being run off in the direction indicated by the arrow in the operation of weaving the fabric, A. The warp (a′) may be of the same or different material as the warp (a) and it may be of the same or different texture. This thread (a′) bears the system of characters. The marks indicate quarters, halves, three-quarters, and whole yards, or halves and full yards, or full yards alone, but for the sake of accuracy it will generally be desirable to avoid indications for fractions less than one-quarter yard. This cord, provided with the system of marks to form the indicating and measuring warp, is of a length somewhat greater than that of the regular warp (a), the cord being spooled for convenience in handling. In spooling this warp cord (a′) is wound on the spool so that in the subsequent unwinding that portion of the cord or thread containing the mark or character corresponding with yard No. 1 will be delivered first, the other marks following in order. Consequently the cord will be so beamed with the rest of the warp that in running off in the weaving operation the mark representing the highest value will be first unwound, the other marks or characters representing successively-decreasing values

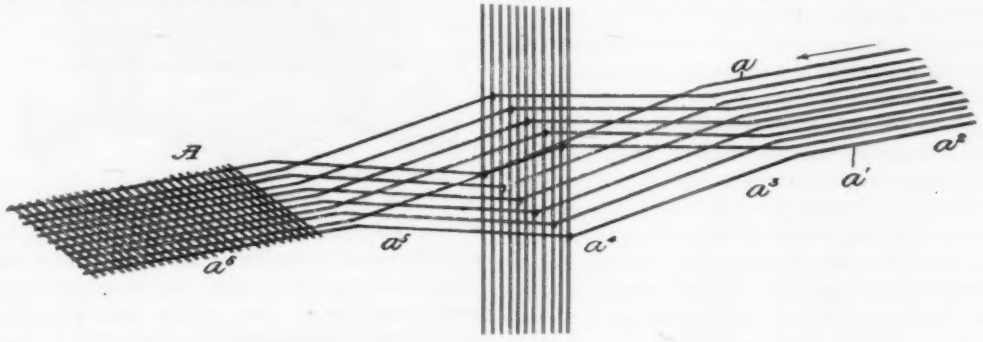


FIG. 1.

The indicating marks are placed on a cord or thread, and beamed with the warp. This arrangement facilitates the location and reading of the indicating marks or characters and computations based thereon.

Fig. 1 shows the cord in the warp and also in a section of the woven goods.

following. By this means the attendant, by noting the mark exposed nearest the beam, can instantly determine the length of the warps remaining on the same. By knowing the total capacity of the measure he can by subtraction accurately compute the length of the fabric woven.

A FLY PROTECTOR FOR RING FRAMES.

Both the quality and quantity of the production of a ring frame depend upon keeping the machine and the yarn free from fly waste. For this reason it is one of the first principles of good management in a spinning room to keep the machine clean at all times. A great many devices have been used for automatically protecting the thread from fly

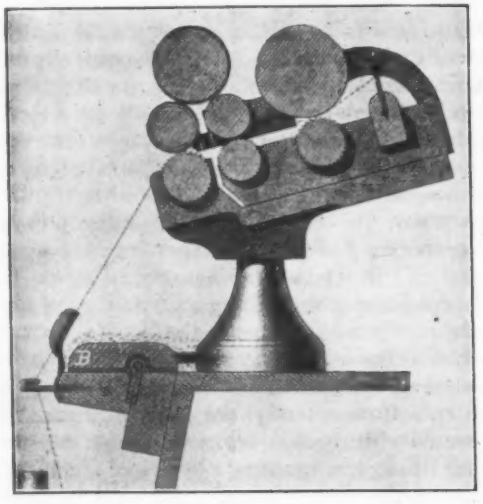


FIG. 1.

waste. Many of these failed of their object because they protected only the upper part of the thread, while the lower part was exposed to the floating waste.

In order to thoroughly protect the yarn and fly waste, the attachment shown in the accompanying illustrations has recently been invented in Germany. Fig. 1 shows a section view of a ring frame fitted with this device, by which it will be seen that the thread is completely protected. It also permits cleaning without stopping the machine, thus increasing the production.

The chief advantage of the attachment is the prevention of bunches formed by fly which is especially liable to be raised during the cleaning of the machine, whether the latter is in operation or standing. Sudden gusts of air are apt to raise the waste, which is then caught by the yarn.

Fig. 2, No. 1, shows the front view of the protector, while No. 2 is the side view. It consists of a plate (1), which is screwed to the frame of the machine. The under side of the frame is V shape, and placed directly

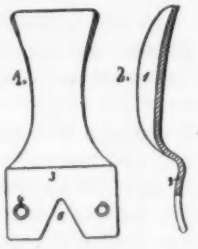
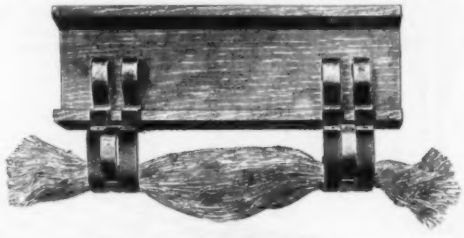


FIG. 2.

above the guide eye. The plate is bent in the form of a trough, in order to allow a movement of the thread side-ways while at the same time holding the latter in position.

A BITTEN YARN HOLDER.

A holder for bitten yarn, manufactured in Switzerland, is shown in the accompanying illustration. It consists of two springs fastened to the frame of the loom. The yarn is placed between the folds of the spiral spring and is held firmly in position regardless of



BITTEN YARN HOLDER.

the quantity of yarn. The threads can be withdrawn as required. By this means the yarn is always in good order, tangling being entirely avoided. The holder and yarn can be quickly removed from one loom and placed on another. The spring is nickel plated and made in three sizes. (Oest. Wollen Und Leinen Industrie.)

The exports of cotton cloths from the United States to Japan increased from 314,223 yards in 1903 to 7,842,365 yards in 1904.

CORRESPONDENCE AND NOTES

Upon Textile Topics at Home and Abroad.

THE MANUFACTURE OF FANCY YARN.

BY JAMES AND CHARLES DANTZER.

The use of special twist threads, commonly known as fancy yarn, has increased rapidly during recent years, large quantities of this yarn in a great variety of styles being consumed in the manufacture of men's wear, ladies' dress goods and upholstery fabrics. France occupies the leading position in the manufacture of fancy yarn owing largely to the assiduous efforts of several French manufacturers, among whom may be mentioned Harmel Freres, Warmeriville, and V. Sabran d'Origny, Sainte-Benoite, who were the first to develop this industry. In spite of its high development neither the practice nor the theory of this branch of textile manufacturing has ever been treated in a systematic way, a fact that is truly regrettable in view of the importance of the industry. The following series of articles is intended to supply the deficiency, and we trust will aid manufacturers not only to make their own fancy yarn, but also to determine the cost of production.

FANCY YARN.

We will consider fancy yarn to include all yarns which have a different appearance from the ordinary single and ply yarn in solid colors; we will not make any study of twines and polished yarn, which are naturally included under the head of ordinary twist yarn. Fancy yarns are, therefore, those which exhibit special effects, produced by difference in shade, size, twist, looping, etc. These effects can be regular or irregular.

PRINCIPAL METHODS.

There are many methods of making fancy yarn. We make no pretensions to describe all of them, as that would be impossible. Many of the machines are of special construction, and are kept secret by the manufacturer. We propose to present all the information relating to fancy yarn that diligent research has disclosed. The following table shows the different classes of fancy yarn, which can be either single or ply.

Single Yarn:

(a) Shaded by dyeing.
(b) Shaded by printing.
(c) Shaded by dyeing and having novel construction.
(d) Novel construction obtained in the spinning or preparatory processes.

Ply Yarn:

(e) Ply yarn with single strands of different colors.
(f) Novel construction by twisting.

FANCY SINGLE YARN.

Shading is an effect obtained by printing or dyeing. It consists in printing or dyeing a skein of yarn so as to produce shaded bands or lines at intervals.

Shading by Dyeing: This process is used much less than shading by printing. It gives three varieties of effects: Blended (fondu), splash (flamme) and barred (chine).

The blended effect is shown at Fig. 1, and consists of bars, each of which shades from dark to light, producing a rainbow effect and a changeable reflection of light.

The Splash effect is shown at Fig. 2. It consists of a solid ground interrupted at irregular intervals by bleached or colored spots or spaces.

The barred effect is seen at Fig. 3, and consists of well defined bars on a solid ground.

The blended effect (Fig. 1) is obtained very easily. The skeins are opened up and stretched on a vertical frame, which is then lowered in a very weak dye bath. The process of dyeing lasts for an hour and a

half. When the skeins have been in the liquor five minutes, the frame is raised slightly at intervals, so as to bring the top of the skeins into the air. The process is continued

FIG. 1.

until the entire section is out of the bath. In this way a well graduated shade is obtained. The yarn is then washed in a soap

FIG. 2.

solution at about 85 degrees F. for several minutes, and then rinsed. This process is especially well suited for woolen and worsted yarn.

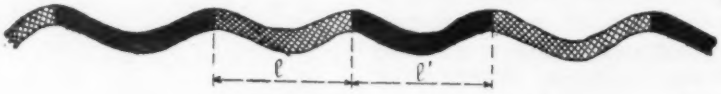


FIG. 3.

The splash effect (Fig. 2) is still more easily obtained. The skeins are reeled to measure at least one yard, and knots are tied in the places where it is desired to have a splash ef-

FIG. 4.

fect. Their form and number vary according to the effect desired. The yarn is then dyed in the ordinary way. The interior of the knot is protected and does not take the dye. After

FIG. 5.

dyeing the knots are untied, and if a still different effect is desired, new knots are made in other places and the yarn again colored.

Fig. 4 shows a shaded effect obtained by

FIG. 6.

tying the skein at intervals with twine or by fastening small clamps on the skein. In this way the compressed portion of the skein is protected against the action of the dye.

Shading by Printing: This method is more simple and practicable than the dyeing process. It enables finer and more varied effects to be produced.

The Jasper effect, shown at Fig. 5, is obtained by very fine corrugations in the printing roll, dark colored stripes being printed on a white or light colored ground.

The Splash effect is similar to that obtained by dyeing. It presents shades at rather regular intervals; for example, one or two large bars will be contiguous and followed by two or three smaller bars on each side, then the yarn will be of solid color for some distance before the shaded effect is repeated. The ground is either white or is colored a very light shade, and blends with the effect shades.

The Cameo effect is shown at Fig. 6. It is similar to the splash effect, but always produced on a ground contrasting sharply with the effect colors. The Cameo effect can be obtained by printing previous to dyeing. If the skein is white with black or dark colored shades, it can be dyed a light shade after printing. If the skein has been printed in a light shade, it can be colored another shade which will modify the first one without ab-

sorbing it. Or the skein being colored a light shade, then printed with a shade much darker, it can be colored a third shade which will change the character of the former. Thus, for example: A very clear orange

FIG. 7.

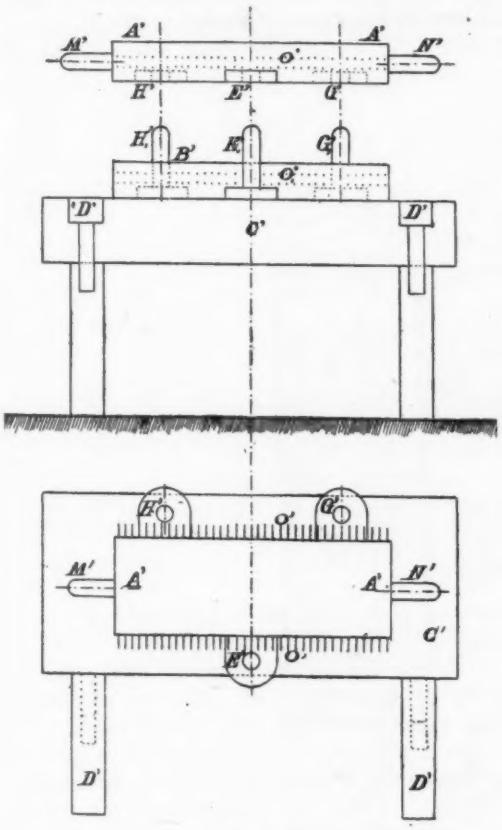


FIG. 8.

printed with a very dark yellowish orange, then colored a very light blue, will give a green ground with a maroon shade. The shaded effect can also be obtained by stripping a colored ground. This process is very economical, because it saves coloring and thickening materials. Stripping is generally done with acetate of tin.

The apparatus for printing shaded yarn is rather simple. The printing plank shown at Figs. 7, 8 and 9, is a primitive device, consisting of two planks, A and B, on the sides of which are inserted two rows of nails, O, about 3/4 inch apart. The second row is arranged obliquely as compared with the first one. The upper plank, A, has two strong handles of wood, M and N. On one side is a cleat, E, and on the other side two other cleats, H and G, each with round hole in it which re-

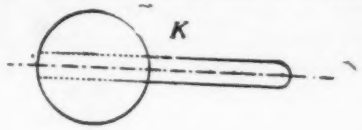


FIG. 9.

ceive the plugs E1, H1 and G1, that are fastened in the plank B; the two planks are thus held firmly in position. The lower plank, B, rests on a block, C, which is very thick, and supported by four legs. It has two arms, D, to support plank, A, while the yarn is being put on the frame. Special cords of wool are drawn tightly over the nails on plank B, to produce the design required. The plank, A,

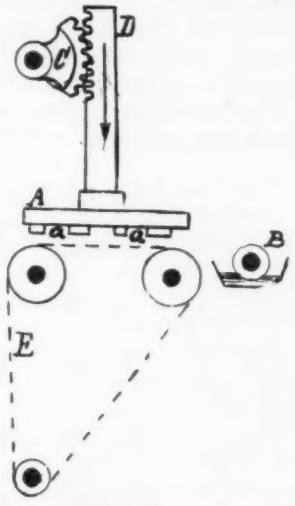


FIG. 11.

is rubbed well into a cloth covered with chalk; after moistening the cords of the plank, B, slightly, the latter is placed under plank A. The two planks are then placed in position, one above the other, and the cords adjusted as desired. Each of the planks is rubbed with a brush dipped in the dye bath, then with a cloth pad dipped in the same bath. Care should be taken to distribute the dye uniformly. The skeins, after being opened up,

are placed on two iron rods, one at each end, in order to permit of their being opened up easily after the process is completed. The skeins are stretched well over the cords on B, . then covered with plank A, which is pounded down by the lead mallet, K, Fig. 9. After this operation, plank A is lifted and the skeins are removed and dried.

The Blondel machine, sometimes used, consists of two shading cylinders, one set above the other. The skeins are placed on an inclined table, from which they are passed to the rollers, at the other side of which they are delivered to another inclined table.

The Wood machine consists of a series of corrugated rolls, arranged in pairs. The upper roll receives the color for the first pair, and the lower roll for the second pair. In this way on dark shades both sides of the skein can be shaded at the same time. On light shades only one side is shaded, the sets of rolls which follow permitting the printing of as many colors on each side as desired.

The Mahon machine consists of two engraved rollers, A and B, Fig. 10, of which one can be moved horizontally and exert a pressure on the other. The color is delivered to one of these rolls by a color roll below. The skein, under suitable tension, is passed between the rollers, by which it is shaded. Unfortunately, these rollers must

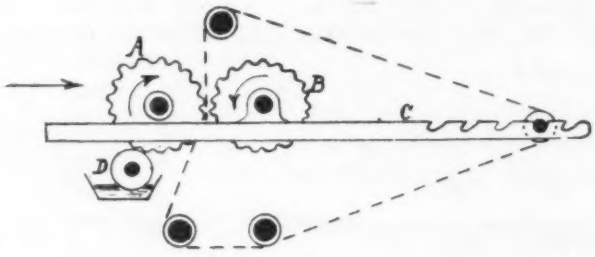


FIG. 10.

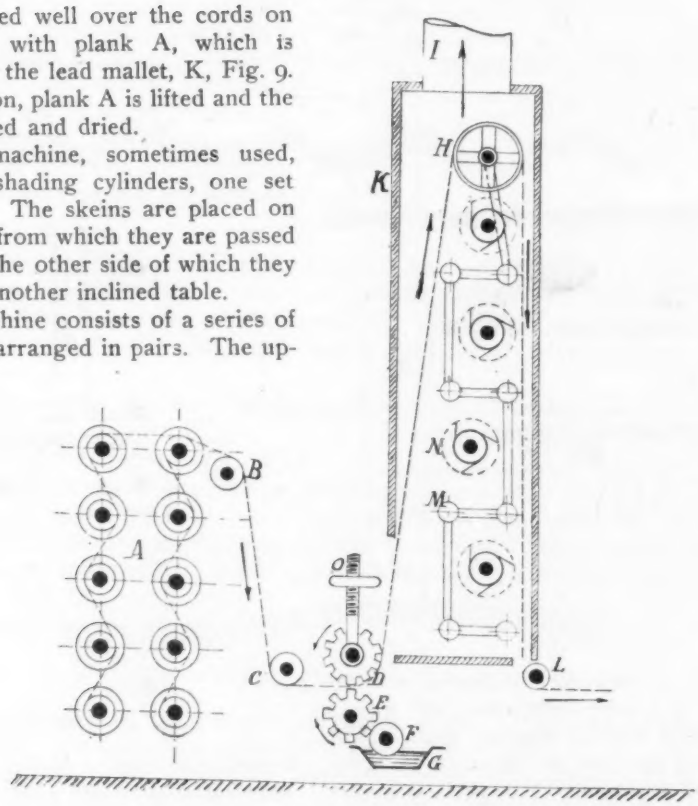


FIG. 12.

be made specially for each design, and are very expensive.

The Talon machine, Fig. 11, is very convenient. Reglets are used, being designed to produce the shaded effect desired. This machine was derived from the ordinary printing press. It consists of a plank, A, on which are wedged the reglets, a. This plank rests on a carriage, which carries it over the inking roll, B, and then carries it back under the press. The plank is pressed on to the guide rolls, B and C; then between the printing rolls, D and E. After being printed the yarn is carried into the drying chamber, K, where it passes upward to the guide roll, H. After passing through the printing rolls, the yarn does not come in contact with the first guide roll, H, until it is fairly well dried.

This roll, H, is turned by the yarn, which passes down to the guide roll, L, where it emerges from the machine. Between the two folds of the cloth are placed a series of re-

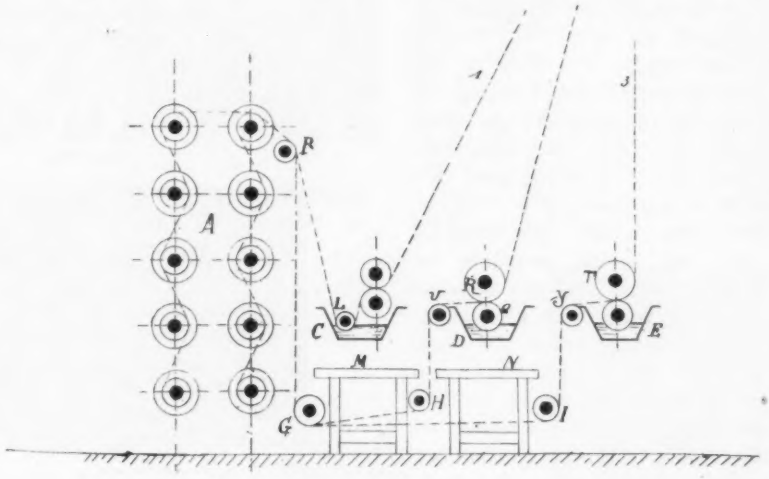


FIG. 13.

skein, E, by means of the gear rack, D, and sector C. After printing the skeins are dried slowly. The steaming which follows is a very important process. It consists in hanging the printed skeins on racks in a wooden tank having a double bottom. The false bottom is covered with a thick layer of straw, under which is a perforated steam pipe. After the skeins have been suspended in the tank, the apparatus is covered with woolen or cotton cloth. The steam is then introduced at low presure. After steaming the yarn is dried, and the skeins shaken open. It is preferable to fix the color with salts of aluminum and treat the yarn in a soap solution at 75 degrees F. Much loose dyestuff is thus removed from dark colors.

Fig. 12 shows the printing machine made by M. Masurel-Leclercq of Roubaix, and which is adapted for handling warps. The drying is continuous. The yarn to be printed is first run over the tension rolls, A, and volving fans, M, which create a current of air and facilitate the drying process.

Fig. 13 shows a warp printing machine by which three webs of yarn are fed to the rollers. Two of them, 2 and 3, pass through printing rolls by which the yarn is shaded. The webbing, 1, passes through rolls by which it is printed a solid color without shading. The three webs are united into one at P, where it enters a Masurel-Leclercq drying chamber. This machine is capable of a large production, and the results are much superior to those obtained by printing the yarn in the skein.

After all, however, the shaded effects that can be obtained by printing are comparatively limited, being produced by the alternation of different colors.

(To be continued.)

Barras is a coarse linen fabric originally made in Holland.

THE CAUSES OF DEFECTS IN FABRICS.

BY ALFRED F. BARKER.
Professor of Textile Industries, Bradford Technical College.

(From a lecture before the Society of Dyers and Colorists.)

About fifteen years ago, on coming into this district and endeavoring to teach my students the principles of double cloth construction as applied in the design of fancies, they told me that they did not wish to have anything to do with double cloths. Double cloths might be all right for Huddersfield, Leeds, or Scotland, but what had double cloths to do with Bradford? Five or six years afterwards Bradford was running on blistered crepons based upon double cloth structures. Today I have a new mechanism for producing pile fabrics mounted upon two of our looms. If we suggested to a producer of such fabrics that he should experiment on gauze structures we should probably be laughed at. Yet this method of weaving pile fabrics—which may revolutionize pile weaving with wires—is nothing more nor less than gauze weaving. We must not take too limited a view of our work. If we do this we shall not make that progress which is so necessary nowadays. At the same time we must not allow our general views and studies to take away from our special excellence in some particular branch. We must study our own particular branch most carefully, and add to that a general knowledge of the preceding and succeeding processes. The value of such comprehensive studies will be evident as we pass on.

With reference to testing for defects in fabrics at any particular stage in their production we sometimes encounter apparently unsurmountable difficulties. The question recently arose as to irregularity of twist in a certain yarn and the effect of such irregularity in the finished fabric. In the particular yarn in question, the irregularity was most marked, and the report of our research assistant was "twist most irregular." I was not satisfied, however, to note that the variation in twist was very marked, but required a comparison with other similar yarns One of our standard yarns was therefore selected from twelve yarns of somewhat similar characteristics and used for comparative tests. It was found that in this particular yarn the variation was not nearly so great as in the yarn in question (see Fig. 1), and yet subsequent tests showed that in the other eleven yarns the variation was just as great as in the yarn employed in the cloth in question; and I could not find another yarn which showed the small variation noted in the one odd yarn first selected for comparison.

It will be my endeavor in this lecture to lay down the lines upon which we may hope to attain to a high state of accuracy and efficiency in textile research work, and to demonstrate the principles and practice involved. We shall naturally have to take a few particular cases as examples, but my chief point

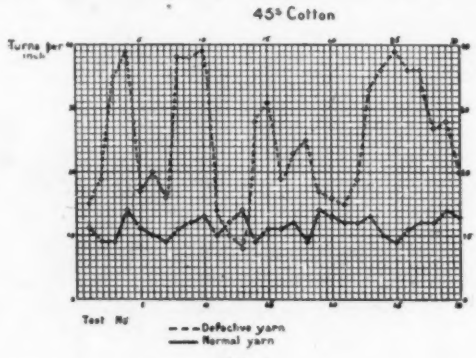


FIG. 1.

will be to draw attention to the causes of these defects so that they may be guarded against in whichever of the various processes —from the raw material to the finished fabric—they happen to arise.

In dealing with defects there is a tendency to at once ask "whose fault is this?" and then simply to make the guilty party pay for it, if possible. There is not always the tendency which there ought to be to take the attitude from which one would argue—"here is a defect which may again arise in the future; let us see what is the cause of it, and if possible guard against its recurrence." I do hope this attitude will be more developed in the future, because then we shall be able to put our hands more readily on the causes of defects and so avoid them.

Another point which should be mentioned is that it is frequently easy to locate the cause of a defect but most difficult to pre-

vent it. I might give as an example here the dyeing of mercerized cotton goods, where there is a great tendency for the dye to strike very rapidly, and consequently irregularly, in light shades. It will, however, be evident to all that we shall be less likely to produce defective fabrics if we know the conditions under which defects arise.

I will classify the typical defects to be discussed under three heads. First.—Defects due to faulty selection of materials, or to faulty structure of yarns or fabrics, or to both. Second.—Defects due to inefficiencies in the machinery employed. Third.—Defects liable to arise owing to mistakes on the part of the working staff. These three divisions we shall find very well suited to our purpose.

With reference to defects due to faulty selection of materials, I may instance two fabrics, which were submitted to me some time ago. The complaint was that one of the fabrics—the "quality supplied"—was very much duller than the other, which was the "standard." Of course the manufacturer attributed the fault to the finisher. On the other hand the finisher contended that the fault was in the material. Examination of the material leaves no doubt as to where the defect really is. It is undoubtedly in the selection of the raw material. It is impossible to put the same finish and lustre on to the "quality supplied" fabric as there is on the standard fabric. To test this thoroughly we mounted a dozen slides of each of the fibres. Taking these twenty-four slides and examining them under the microscope I classified them as "standard" and "quality supplied." After having done this without a mistake several times, I gave with confidence a report to the effect that the defective lustre was in the fibre itself and was not due to inefficient finishing.

In the early days of "mercerized" cotton, we were continually troubled with the lack of lustre, or very marked variation of lustre, on yarns. That of course was also largely due to the faulty selection of materials. It is now a pretty well-known fact that unless we take a suitable cotton we shall not obtain satisfactory results. It is thus evident that the most careful selection of the initial raw material is always an important factor; and in producing lustres we may say that failure to select the right raw material means certain failure to produce a salable article.

I have come across a defect of a somewhat similar nature—a want of clearness and of lustre—in serge cloths; but in this case not due to the material employed. About three or four years ago I received from Ireland a very beautiful bright serge and along with this piece the material that the Irish people had made in imitation of this brightly finished serge piece. The wool in the two serges was precisely the same; the structure of the cloth seemed to be the same and consequently the finishers were blamed for not obtaining the desired clear bright effect. I made several attempts to obtain this clear-

FIG 2.

ness and brightness by refinishing the goods, but with little or no success.

Eventually I found that the defect was neither in the raw material nor in the finishing nor in the structure of the cloth, but in the structure of the yarn. The yarn of the original cloth was a flyer spun yarn. The yarn of the Irish cloth was a cap spun yarn. It would seem that given the same raw material it is impossible to match a flyer spun yarn with a cap spun yarn, although certain attempts had been made to do so by means of patent spindles applied to the cap frame, etc.

A defect in which the actual structure of the fabric is at fault is illustrated in Fig. 2. In a particular case a corkscrew type of structure was used. Seeing that the picks here are comparatively straight, and that the warp threads are doing all the bending (we

can pull out the warp threads quite easily, but not the weft picks), this cloth will depend for its strength and ability to resist slipping upon the closeness of the make. The designer, in the particular case in question, was told that he must make the cloth lighter in weight, and to effect this he reduced the set slightly, with the result that the texture was more open No defect was noticed until the fabrics were made into garments, and then in man in putting his coat on would suddenly find the sleeve and the body of the coat separated. This was due to the slipping of the warp threads upon the picks. Thus by a very minor change in the structure of the cloth, a very defective fabric was produced.

These examples of defects arising in the raw material, in the yarn structure, and in the structure of the cloth, will impress this point—that the spinner and the manufacturer have no easy task to make perfect structures; the wonder is that imperfect structures are so rarely produced.

Coming to the next class of defects—defects due to inefficiencies in the machinery employed—one of the most noticeable of some years ago was due to bad combing. If you take a short wool, comb it once, spin it, and weave it—after a short time it rubs up into a kind of nap, and the result is a very unsightly piece, seeing that the fabric has not been designed to develop this nap. Thus it is evident that if tops are not perfectly combed the fabrics into which they are subsequently woven are liable to develop a defect in the actual wearing of the fabric.

Coming next to the spinning, defects are often encountered which are due to "twitty" yarns. Fig. 3 shows a yarn submitted for examination. The manufacturer complains that he cannot weave a satisfactory piece from it, and I think you will agree that he can hardly be expected to, in view of the variation in the thickness of the yarn. The yarn is over spun. No doubt the spinner, owing to the enhanced value of botany wools, has been trying to spin cross-breds further, that is, to a higher count, than is possible. The yarn shown in Fig. 3 is taken directly from the tube or spool.

Fig. 4 shows another yarn taken from the fabric itself. If thick, soft threads come alongside thin, hard threads, the result will be a streaky piece, in part due to the soft spun taking a deeper shade in dyeing than the hard spun. Even if there were not a dyeing defect, there would probably be a

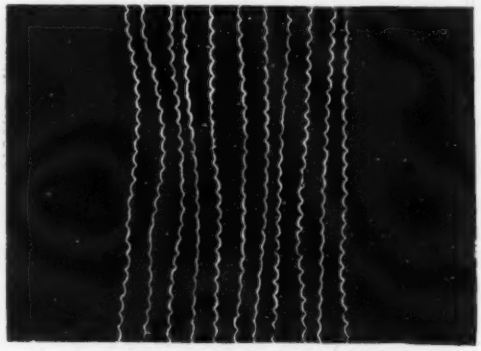


FIG. 3.

structural defect, which would result in a defective appearance in the finished fabric. As a matter of fact, the goods from which these threads are taken were returned as unsalable. Here I may remark that "bad trade" causes more defects than anything else. There is a saying to this effect, and it is no doubt partially true.

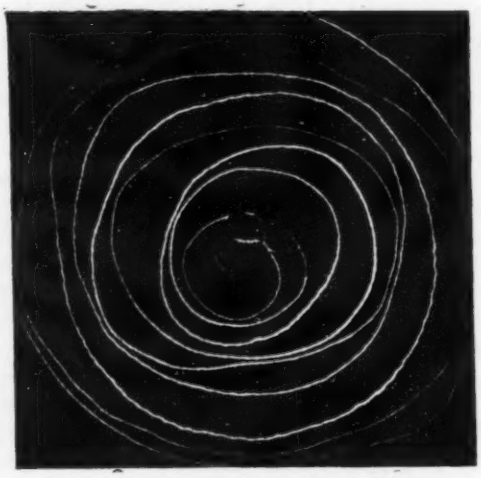


FIG. 4.

In the next example there is a fairly marked stripiness across the piece. This defect is due to a very curious cause, which we

have had some difficulty in arriving at: it is an example showing how very small things will create a very considerable disturbance in the manufacturing processes. The last layers of yarn upon a spool or tube are naturally more subject to atmospherical conditions or to geting dirty, and it is not sufficiently realized that very often a change does take place in the outer layers of the material which does not take place on the inner layers, and that that change has a marked influence when the piece into which the yarn is woven comes to be dyed.

If you buy a fleece of wool in Australia, bring half of it over in the greasy state and half in the scoured state, the half that has been scoured some time will take a very different shade in dyeing from the half which has been shipped in the grease. A somewhat similar argument may be applied in the case of spools, tubes, etc. An action takes place on the outer layers. We cannot as a rule see the result in the grey piece, but it is there all the same, and it is this latent defect which has caused so much trouble both in linings and coatings.

We shall see in a moment that the spinner and manufacturer together—and neither the spinner nor the manufacturer separately—can overcome this defect. By the "pick" on the bobbin is meant the distance from the outer layer to the inner layer and back again to the outer layer. Different spools may differ considerably in length of "pick." A spinner who is unaware of the defect here likely to be developed, is liable to have two or more "picks" running, even in the same shed. The effect of this difference in "pick" upon the fabric is demonstrated by means of Figs. 5 and 6. Fig. 5 represents diagramatically the position likely to be occupied by the outer layers of a spool with a pick of 144 inches, when woven into fabrics of various widths. (Note.—Strongly marked section of thread—outer layers.) If we take a piece 36 inches wide we obtain an effect that is practically invisible in the cloth. If, however, we happen to hit on the conditions shown in Fig. 6, we shall note then that we actually have 13 picks of outer layer together and 13 picks of inner layer up the edge of the piece, with a distributed effect in the centre. When the piece is dyed we get a distinct stripe effect and a markedly defective piece, with which of course the dyer will be charged, seeing that the defect has been developed in the dyeing and has never been noticed before. But here another point comes in. If we select the best conditions, which are shown in Fig. 5, i. e., a 144 inch pick for 72 inch width of cloth, we are liable to develop another defect in such goods as Italians, known as "railway lines," and it is a question whether it is better to eliminate the stripe across the piece and to risk the development of the railway lines, or vice versa.

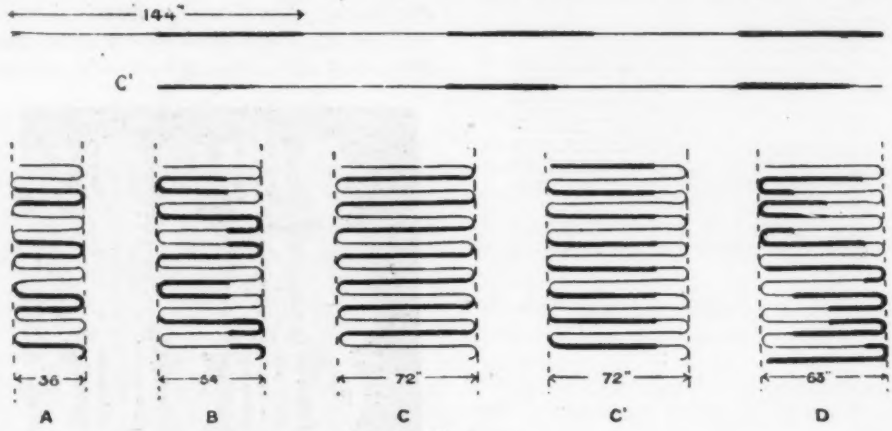


Fig. 5.

Another defect often noticed is due to uneven wefting. In this again one is very liable to think that it is a defect in the dyeing. In fact, I have known it more than once attributed to the dyer without a moment's hesitation. A photograph right through

such a cloth is frequently very useful. Sometimes it takes three days to photograph through a piece. In the particular case referred to we have proved definitely that a defect which appears to be a dyer's defect is really due to uneven wefting. Following up the defect, the reasons for uneven wefting were found to be in the loom; the letting-off apparatus had not been properly fixed and attended to. The weaving was very badly done indeed.

Another defect very difficult to get rid of

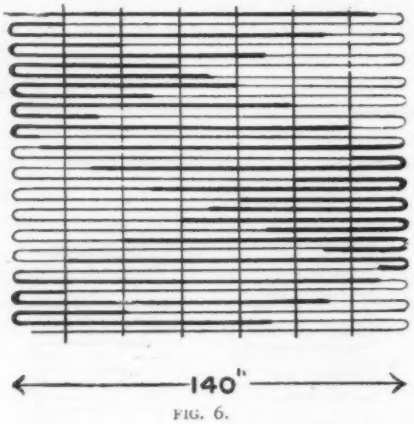


FIG. 6.

is of a quite different type, and that is the "cockling" which occurs in a number of fine worsteds, which the finisher has very great difficulty in overcoming The defect frequently arises from the greater tension on the weft yarn when the spool is nearly empty, as compared with the tension on the yarn when the spool is nearly full. This is a very marked difficulty in weaving fine worsted goods, where the pieces are liable to cockle, for if we give the defect a chance in the way shown, do what he will the finisher cannot get rid of the cockles.

(To be continued.)

About four and one-half months elapses between the sowing of the cotton seed and the time when it is ready for picking.

In regard to quantity of cotton produced Egypt ranks fourth; in regard to quality it ranks next to Sea Island.

A CROSS STITCH CLOTH.

BY WILL NELSON,
Head Instructor in Warp Preparation and Weaving.
Lowell Textile School.

Fig. 1 shows a piece of cloth which will rank among the most exclusive novelties in cotton goods. Such cloths have been made in quantity only in France and other European countries where the hand loom is still used for the production of high grade novelties in fabrics. It is only within recent times, so to speak, that any effort has been put forth to perfect a motion that would allow such cloths to be made on power looms with accuracy, and as yet there is no such device in this country that can be attached to looms with profit. The cloth has a most pleasing effect and will command a ready sale when a

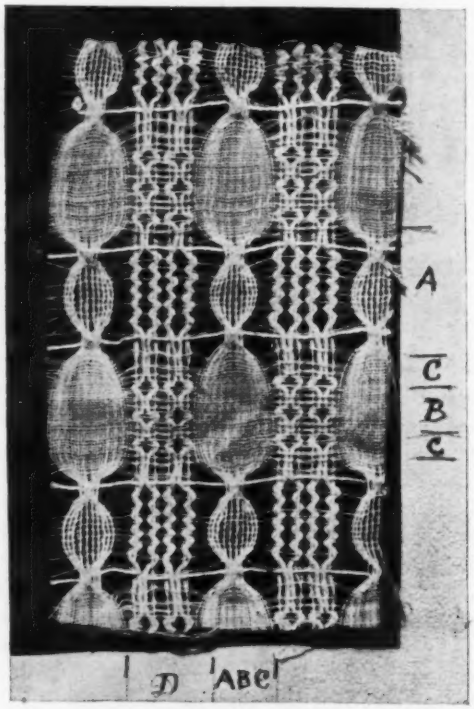


FIG. 1.

sufficient amount is produced at a reasonable cost. The need of special apparatus for the weaving of such patterns will be readily recognized by a careful inspection of the

sketches. We will consider the cloth from two standpoints; plain and fancy, or leno.

To one acquainted with plain cloth only, the part marked A, will appeal to him. To all intents and purposes this part is as near

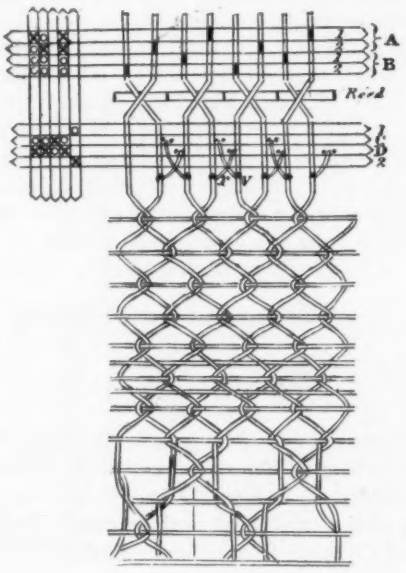


FIG. 2.

perfect as it is possible to make it in connection with a fancy stripe. To make a single plain cloth of fine texture the threads would have to be drawn two, three, four, or possibly six in a dent; seldom more than six, and generally two or three. The reason for this is that the ends will not spread out, neither can the filling be beaten in when there is a change of shed every pick as in ordinary plain cloth. It follows that part A could not be woven under ordinary circumstances with forty threads in a dent, hence the necessity of special apparatus.

To one acquainted with leno cloths, especially the finer grades, the parts B and C would have the greater interest. Part B shows what might be termed a 10-loop lace leno of the two-and-two order, that is, two ground threads and two crossing threads. It would be impossible to weave the two sets of threads in one dent; two, four at most, being all into which the filling could be beaten. It is not possible to produce the stripe, A B C, under ordinary conditions, for at B and C there is a leno within a leno. A leno is made by the crossing of one or more threads over others, and only those threads which are in the same dent can be crossed. For weaving the three parts which are woven from the same threads, there must be a special apparatus in front of or in the reed. Murphy, a textile writer of fifty years ago, describes the production of cross stitches by the use of doups in front of the reed, Fig. 2, but there is a marked difference between the texture of the two cloths, Figs. 1 and 2. Fig. 2 is adapted for very coarse material. In moderately fine cloth an impress of the doup would be left by the lay beating up against the last pick of filling. Even the doup in front of the reed would require a special apparatus.

Stripe D shows the coarse ground threads for the net leno cord, which are woven leno when the heavy pick is not crossing. This unusual texture requires two distinct sets of doups in close proximity to each other, the threads of one doup acting on the crossing threads of the other. The threads from the loops of two distinct sets of doups pass through one dent. Fig. 3 is the harness draft. Four sets of doups are required, two for stripe A B C, and two for stripe D. Three bottom doups and one top doup are

FIG. 3.

used. The portion for stripe A B C, comes on harness 17, 16, 15, 14, 13, 12, 11, 10. Doups 4 and 3, would be drawn in by the ordinary metho l used for bottom doups. Stripe D is drawn on harness 9, 8, 7, and doup 2. The double threads, which pass through harness 8 and 9, are the ground and the crossing threads for the second doup and are then drawn under the crossing thread in harness 7, and doup 1, acting as the ground thread for the first doup. A single 60 warp thread would be used all the way except for the coarse leno thread in stripe D, which is 2/10. The filling is single 75 and 2/10.

Figs. 4, 5 and 6 show the management of movable and stationary reeds, also a motion by which to weave the cloth already described. A loom with a single lift dobby would be best for this work, both on account of the slower speed and the shed coming to a level after every pick. Fig. 4 shows the

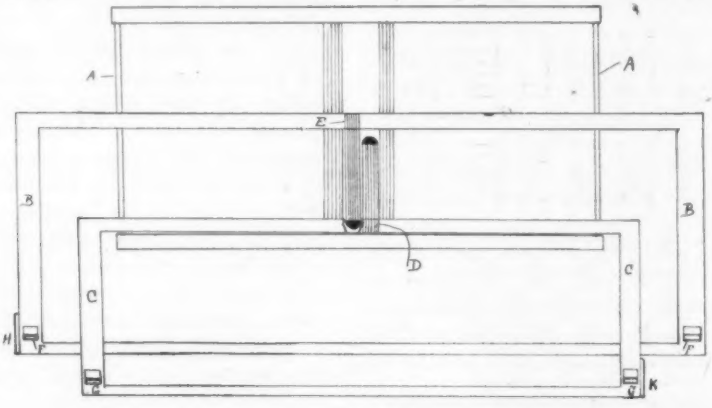


FIG. 4.

arrangement of reeds, practically three being required. A is the stationary reed; B and C, movable reed frames; D and E, special portions of the reed fixed to the movable frames; F and G, small iron rollers on which the lifting and depressing levers work; H and K, slots in which the sliding levers work.

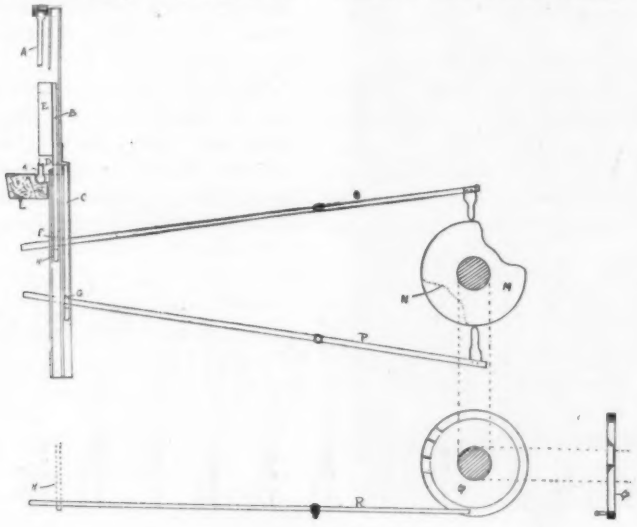


FIG. 5.

The regular reed has spaces to allow for the working of the movable parts. E and D are of reed wire of special width, fixed to the movable frame. The number of dents and

corresponding spaces in the fixed reed are determined by the pattern. It is necessary that the movable dents be flush with the face of the regular reed, otherwise the filling will not be beaten in straight. As these parts have to receive the blow, the movable parts must be strong enough to resist the strain. Frame C, can be so arranged as to support the special dents on frame D. The regular reed should be at least two inches deeper than the ordinary reed, but a portion of this will be below the race plate.

To save as much space as possible in the regular reed and also reduce to the smallest possible limit the action of the movable parts, frame C, will be lowered at the time that B is raised; B will be moved to the right as C

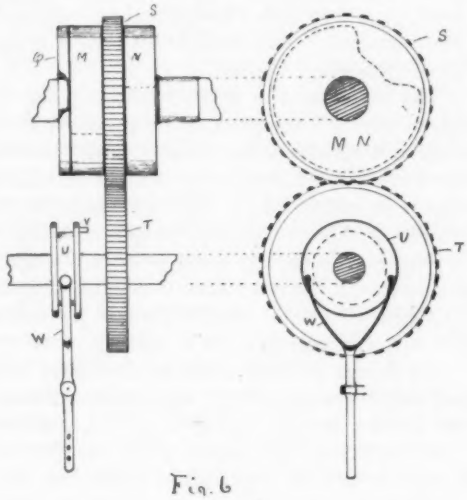


FIG. 6.

is moved to the left. The moving of both parts in this manner requires very little action on the controlling lever. This movement must take place after the last pick of filling has been beaten in. The last pick in the cloth part, B, must be beaten in before any attempt is made to form the crossing, C, otherwise the fine filling would be broken. The arrangement shown at Fig. 4 is required to give the necessary change. Single parts only are shown.

The cams, M and N, control through the levers, P and O, the lifting and depressing of the movable frames. These cams are shaped alike, but set at opposite times. Q is a cam with an indention on the inside face and so arranged as to give a sliding movement to the movable frames as each is raised or lowered the required distance. Small iron rollers are placed in the frames to reduce friction as much as possible.

Fig. 6 shows the cams and means of driving. U is a sliding grooved collar with a pointed pin, V, attached. The grooved collar and gear, T. are placed on the crank shaft, T, being loose on the shaft and held in place by set collars. The grooved collar is allowed

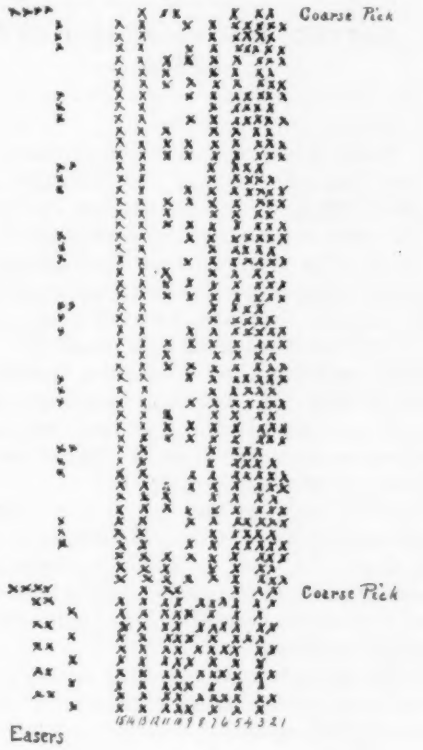


FIG. 7.

to slide on a key bedded in the shaft. The sliding arm, W, is used to press forward the collar so that the pin will engage in the gear, T, at the right time. The cams and gear, S, are loose on a stud or countershaft and arranged in such a manner that they will control the levers, O, P, R, which operate the sliding frames.

Fig. 7 shows the pegging plan for Fig. 1. The pattern requires 60 picks. Six easing rods are required, two more than the usual

number for four sets of doups. This is on account of the extra cross for the coarse pick. The ground and crossing threads for the third and fourth doups have separate easing rods. During the ordinary construction of leno cloth the ground threads do not pass around an easing rod, but owing to the excessive crossing the yarn must be eased off. The easing rod for the first doup vibrates almost twice the usual distance owing to the yarn crossing between the two doups.

LETTERS TO A YOUNG WOOLEN FINISHER.

No. 1.

Dear Henry: Your letter is just at hand and I am glad to hear that through my recommendation you have secured a position as overseer of finishing, and I shall take a lively interest in your welfare, and will do anything in my power to make your first attempt to take full charge of the work a success.

You have had quite a thorough experience as second hand; first with me, before I retired from the work, and later with others, and I am sure I cannot see any reason why, by persistent effort and close attention, you may not succeed.

To be sure, as you say, it is a small job, but it is better so at present, and you will find all you want to do if you keep things moving in good shape, and in due time you may be able to secure a place that will command better pay.

You must bear in mind that finishing is different from the other branches of woolen manufacturing in that it is so dependent upon a constant exercise of good judgment and that hardly any part of the work can be done by any set rule to insure good results.

Your past experience has been largely confined to one place, under conditions and surroundings that may not prevail in your new place, and you will need to be very careful at first. If you find things have been done differently than you have been accustomed to, do not be too anxious to make radical changes until you are sure they are needful.

You have quite a valuable record of formulas of soaps, burr-dyes, etc., but you must bear in mind that the same formulas cannot always be relied upon when going to a new place.

The difference in the water alone often calls for a change in the soap preparation and the method of procedure, to say nothing of the difference in the wool oil, the condition and quality of the stock used, and many other things that tend to cause a variation in the work.

You know what changes we had to make at the Milford Mills, when there was a change from one wool oil to a cheaper grade, and how that low grade line of goods in which so much shoddy and waste was used, called for a special soap and treatment in order to bring them out bright and perfect. The man who goes to a new job determined to rely upon the formulas he has used elsewhere will most likely get into trouble.

The fact that the finisher whose place you are to take left the position because the goods were not satisfactorily finished indicates that something is wrong, but you must remember that it is impossible to find a remedy for the trouble without a careful study of conditions.

Possibly there may need to be a change in the soap, or the way it is used, but you are only likely to make matters worse by taking any formula you have as a remedy.

Let things go along just as they have been and watch the goods through every process, and before the first set gets to the inspector I am sure you will discover the trouble and be able to act intelligently in correcting it.

You know how important it is that every detail of the work has your careful attention, and how at almost every turn you must decide and act in accord with good judgment rather than any rules and formulas.

The soaping of the goods in the fulling mills, the treatment in scouring, the gigging and shearing—in fact, almost any part of the work may go wrong by being overdone or underdone, if not regulated by careful attention, either by yourself or one in whom you have confidence. You know that in the carding and weaving the correct condition and mechanical adjustment of the machinery has very much to do with the results of the work.

When the cards are in perfect condition

and properly set for the work in hand, the results depend largely upon keeping up these conditions. If the fixer has the loom in good order, and every part working perfectly and in harmony with every other part, the weaver has only to attend to the proper changing of the filling and mending of the broken ends to complete the perfect work. But in the finishing room it is far different. The fulling mills may be in the best of order, and yet without attention be the cause of evil results by fulling too much, chafing, overheating, etc.

In the gigging you know how important it is that the work be regulated by good judgment, and how the operation is as likely to ruin as to benefit the cloth if left entirely to the condition of the machines or done by any set rule.

The shear also fails to give good and uniform results if care and good judgment are left out of the question.

There are other things that render the finishing peculiarly different from any other department of the work, and tax the skill and constant attention of the finisher.

One of these is that it calls for a correction so far as possible of a thousand and one errors of the other departments.

All the way from the picker room to the weaver's perch causes of trouble for the finisher are constantly arising.

Every imperfection in the construction or weight of the cloth must be taken into account in the finishing, and however imperfect or "off weight" the cloth may be, it devolves upon the finisher to endeavor to bring it out as nearly perfect as possible.

The changes of oil, dyestuffs, soap, etc., all tend to increase the care of the finisher, and under the best of conditions and management there is always something unexpectedly happening. The finisher has to take the multiplicity of happenings and bring good results in the end and sometimes order out of disorder.

Don't let me discourage you, Henry. These things don't all come in a lump, though it may seem so at times. You must keep an eye out for whatever may happen, give close attention to detail, as I always instructed you, and, above all, keep your head. Drive your work and never allow it to drive you. Keep your machines in good order by small repairs, so that they may not get in bad condition.

When once you have got your soap so it is doing good work, don't change it until there is some call for it, and see that everything in the fulling and scouring processes is done right and not slighted.

With clean goods, nine-tenths of the work is accomplished. With goods that are not thoroughly clean no succeeding process can be right. Dirty or soapy goods can never be gigged sheared or pressed right.

I know that these things have all been taught you in a theoretical way, but they will often be forced upon you in a practical way if you are not constantly on the alert.

Don't get the idea in your head that you "know it all." The finishing room, above all other places, is where that exalted position is never attained. It is a constant school, and you will do well, as I have often told you, to be a close student of cause and effect, by studying from effect to cause.

Whatever may come up in your work that is wrong, do not be content to allow it to correct itself or to correct it without clearly understanding why and how it happened, and making careful note of how the difficulty is overcome.

In the coming days, if you meet with any difficulties or there is any way in which I can be of service to you, do not fail to let me know, as I shall be more than glad to help you in any way possible.

It takes a long experience in the finishing room to meet all the difficulties that are liable to arise, and you will doubtless have some experiences which are new to you, especially as your work has heretofore been confined very largely to high grade goods, and you are now to go on to work of a lower grade, and they may present new lessons to be learned.

In your dealings with the help be always fair and honest with them, but never too familiar. Give them to understand that you mean business during working hours.

In your attitude toward your employers, ever bear in mind you are there for their interests, and should conduct your room accordingly.

Hoping soon to hear that you have made a good start and a favorable impression, I am, as ever, your friend,

TURNER.

Questions and Answers.

Under this head we undertake to answer, free of charge, to the best of our ability, any pertinent inquiry pertaining to textile matters received from any regular subscriber to the TEXTILE WORLD RECORD. Questions should be stated as briefly and concisely as possible. Inquiries pertaining to textile processes, machinery, improvements, methods of management, the markets, etc., are especially invited, as well as any legitimate discussion on the views expressed. All inquiries must be accompanied by the name of the person inquiring, not for publication, but as an evidence of good faith.

For reply to questions that are not of general interest to readers of textile journals, such as those relating to the composition of yarns, analysis of fabrics, etc., we will charge the enquirer with the cost of the investigation.

Porto Rico Cotton.

Editor Textile World Record:

I have raised a quantity of cotton here on my plantation in Porto Rico, the grade being equal to Sea Island. I want to get into direct relations with New England brokers, with a view of selling my cotton to the mills. Will you advise me how to do this? Porto Cotton (582)

On page 472 of the Textile World Record Official Directory there is a list of the cotton dealers in Massachusetts, among which our correspondent could undoubtedly find several who would answer his requirements. On page 401 is a list of the yarn spinners, classified according to the grade of yarn spun. The quality of cotton mentioned, Sea Island, is used for combed yarn, and on page 411 is a list of the spinners of combed yarn.

Dyeing Black with Direct Dyes.

Editor Textile World Record:

What is the shrinkage in dyeing blacks on cotton yarns with direct dyes? Cable (584).

In dyeing direct blacks or diazo developed blacks the loss by shrinkage is usually from 4 to 5 per cent. Aniline salt black gives a shrinkage of only 2 1/2 to 3 per cent. Palmetto.

The amount of shrinkage would depend somewhat on the quality of the yarn and the twist and count. A poor yarn made from short stock would lose more than a long stapled, well carded yarn. A fair loss would be about 3 per cent., but under certain conditions it might reach as high as 6 per cent. The so-called shrinkage when dyed with direct colors is more apparent than real. There is really no loss beyond that which takes place during the boiling in the dye when some of the foreign matter in the yarn is boiled out and is not replaced in the dyebath, as is the case when dyed with logwood. If weight is desired, the yarn could be dyed with logwood by the so-called ash method, and then the logwood and the copper sulphate replace the loss which occurs during the boil; the result is a gain instead of a loss.

Baumwolle.

Bluing Bleached Yarns.

Editor Textile World Record:

In bluing bleached yarns, which gives the better results, Ultramarine or Methylene blue?

Nickel-plate (588).

I would prefer the use of Methylene blue as this dyestuff is easily soluble in water and of greater tinctorial power than Ultramarine, thus more economical. I have used with good success "Bleacher Blue," which can be added to the soap bath for washing the bleached yarns. Mutig.

Price of Half Hose.

Editor Textile World Record:

What does the manufacturer of half hose receive for 144 needle goods, weighing 18 oz. per dozen?

Bruin (585).

144 needle half hose weighing 18 oz. was sold early as low as 52 1/2 cents, then were advanced to 55 cents, and now can only be had at 57 1/2 cents from a few parties.

Softener for Cotton.

Editor Textile World Record:

Can you tell us what we can use as a softener for cotton? It is to be put into the boiling tub before dyeing or bleaching. What does it cost per pound, where can we get it, and how much must we use to 100 pounds of raw cotton? Tyler (524.)

A good oil to use for softening cotton is Turkey red oil and some dyers use from two to three pounds per 100 pounds of cotton dyed. On bleached cotton I do not think it is a good thing to use any oil or softener in the boiling bath before bleaching, as the real object of the boiling is to remove the oil and resinous matter in the cotton so that a good permanent white may be secured. For the boil in bleaching I think it would be better to use three pounds carbonate of soda to 100 pounds of cotton and put on three pounds of cotton softener in the last bath before drying. There are a number of specially prepared "cotton softeners" which are excellent. Some of them are advertised in our columns. Baumwolle.

Cotton in Texas.

Editor Textile World Record:

Where can I obtain statistics showing the cotton production of the different counties of the state of Texas? Pittsburgh (579)

This information is found in Bulletin 19, "Quantity of Cotton Ginned in the United States," issued by the Bureau of Census, Department of Commerce and Labor, Washington, D. C.

China Clay.

Editor Textile World Record:

What is the best method of preparing sizing mixture containing China clay?

Aberdeen (590).

The following extract from Monie's "Sizing Ingredients and Sizing," gives directions for preparing China clay for use in sizing, as follows:

"The weighting materials which can be used in size mixing are (1) sulphate of lime, (2) sulphate of magnesia, (3) sulphate of soda, (4) sulphate of baryta, and (5) China clay. The latter has of late years come into general use, the others being now entirely neglected except as additions to the China clay in some cases. In the present article it will therefore be unnecessary to describe in detail any of these substances except the last named.

"China clay is found in many mountainous countries where feldspar has become decomposed, but southern England, China and Japan yield important supplies. The two latter varieties are the best, being much whiter and softer than the other. Another name for China clay, but now rarely used, is kaolin.

"The preparation of the ingredients for mixing may be carried out in one of the following systems:

"First system with five vats:

1st vat is for mixing the flour and water.
2d vat is for promoting fermentation.
3d vat is for storing the fermented flour.
4th vat is for boiling the several ingredients separately.
5th vat is for boiling the whole mixture together.

"Each vat is connected to its neighbor by pipes, and by means of little force pumps the mixture in one can be pumped into the other without difficulty.

"In No. 4 vat the China clay is thoroughly boiled, after which it is run into No. 5 vat; the softeners are next boiled with a little water in No. 4 vat, and then passed into the next vat with the China clay. From No. 3 vat pump the flour into No. 5 vat, after which reduce the chloride of magnesium at 120 degrees temperature to say, 56 degrees Tw., and then allow it to run into No. 5 vat. This vat then contains flour, softeners and deliquescent substances, so that all that is now necessary is the chloride of zinc and the blue. The zinc is mixed with water which becomes boiling hot in No. 4 vat, after which it is brought to 120 degrees temperature and 92 degrees Tw. before being run into No. 5 vat. The aniline blue with a little water to dissolve it, is then also placed in this vat, and the whole boiled together by the admission of steam, a pipe for which from the boilers is fitted into the vat for the purpose.

"Second system with four vats:

1st vat about 8 feet by 4 feet by 4 feet for mixing and fermenting the flour.
2d vat for storing the flour (same size).
3d vat for mixing the flour and other ingredients (same size).
4th vat placed over the top of the third for boiling the other ingredients.

"In the first vat the mixing and fermenting of the flour with the water takes place, after which it is pumped into the second vat. From the second vat it is removed in the requisite quantities to one side of the third vat, this vat being divided into two parts. The object of this division is to admit of the mixing of the flour with the other ingredients in the one half, while a complete mixture may be ready for drawing off to the slashing machine in the other compartment. The boiling pan which is placed over the third vat is connected to each department by a pipe, one of which can be closed and the other opened as desired.

"In each vat or compartment is a revolving dasher which keeps the material thoroughly in agitation and produces a thorough mixing.

"The boiling must in every case be thoroughly carried out; heating only will not do as hard, undissolved lumps remain in the size. The mixing with water must also be uniformly done from time to time, otherwise the size will vary in weighting property. The amount of water to be added cannot be stated as a fixed rule, as it depends upon the materials used. Generally only sufficient to make the mixture run freely is added, but when once a series of ingredients is laid down by a sizer to be used, he should also fix a standard of gravity for each combination."

Dyeing Black Cotton.

Editor Textile World Record:

In dyeing black on cotton yarn with direct dyes, which gives the more even results, common salt or Glauber's salt, also which exhausts the bath more?

Nickel-plate (588).

This depends entirely on the dyestuff used. Some dyestuffs are better dyed with common salt than others and vice versa. Your correspondent ought to ask the dealer who supplies him with the dyestuff which salt is to be used. I have found the Glauber's salt gives more even results and exhausts the bath better than common salt. The latter is somewhat cheaper. Mutig.

New Machinery and Processes.

This department is designed to present from month to month a brief mention of new machinery, devices, and processes being brought out in this country and abroad, that are of interest to textile manufacturers. It is not a list of patents, but of improvements coming on the market. The idea being to present to our readers a systematic monthly record of new machinery, etc., of interest to textile mill men.
We invite machine builders and others to send us such information for this department.

The "Neverslip" Cop Tube. The American Textile Specialty Machinery Co., 363-373 Rider Ave., New York, is placing on the market the "Neverslip" cop tube, which is described in another part of this issue.

Warp Dyeing Machine. The Harper Manufacturing Co., Chester, Pa. A continuous warp dyeing machine, described in another part of this issue.

Yarn Conditioning Machine. Arthur Stead, Agt., 227 Chestnut St., Philadelphia, Pa. A machine for conditioning yarn by imparting moisture. A description appears in this issue.

Thrust Bearing. The Reeves Pulley Co., Columbus, Ind., has brought out a new bearing, which is described in this issue.

The "Neverslip" Shuttle Spindle. In another part of this issue, the American Textile Specialty Machinery Co., 363-373 Rider Ave., New York, is calling the attention of the trade to its "Neverslip" shuttle spindle for cops, which has been thoroughly tested for the past year in some of the best mills of the country.

Bitten Yarn Holder for Looms. Schelling & Staeubli, of Horgen-Zurich, Switzerland. A holder for bitten yarn, which is described in another part of this issue.

A Warping Machine. Gebrueder Sucker, Gruenberg, Germany, are placing on the market an improved cone warper, which is said to possess many advantages over the machines heretofore in use.

A Knitting Machine. Henry Hill, Nottingham, Eng. A knitting machine for gaslight mantles.

A Reel for Silk. Carl Hamel Aktiengesellschaft, Chemnitz, Germany. An improved apparatus for reeling and weighing silk yarn.

Dyeing Machine. The Roessler Dye Works, Weissweiler, near Dueren, Rhenish Prussia, have developed a new dyeing machine for yarn and cloth. It has been kept secret until recently when it was shown to a party of thirty textile manufacturers from France. It is reported that they were greatly impressed by the machine, which was spoken of as "a wonderful invention, yielding excellent results in a simple way."

Water-Proofing Machine. F. Sauerland, 32 Blumenstrasse, Goerlitz, Germany. A process for water-proofing fabrics which is described in another part of this issue.

Loom Temple. Lupton Bros., Accrington, England. An improved loom temple called the "Revoleze." The improvement is in the bearings of the rollers, by which the friction is reduced. Each roller end is cupped out slightly and when in position is held between two balls on which the roller revolves. It is said that very little oil is required and that the bearings allow deep caps to be used as covers.

Mill Sewing Machine. Wm. Mycock & Co., Manchester, England. A machine for sewing pieces together for the finishing process. A chain is substituted for the ordinary pin wheel and enables the widest pieces to be stitched at one run and thus avoids the necessity of removing the pieces from the pin wheel when the cloth is wider than the circumference of the wheel.

Calender Mangle. Nasmyth, Wilson & Co., Patricroft, England. A calender mangle designed to give the results obtained by beetling. The cloth is wound on the roll which is placed between two mangling rolls, which are revolved first in one direction and then in the other, short intervals only elapsing between the changes in direction. To avoid "cording" the rolls are reversed at irregular intervals.

THE NEVERSLIP COP TUBE AND SHUTTLE SPINDLE.

It has been estimated by careful observers that 2 per cent. of the yarn spun for filling becomes waste at the loom. If woven into cloth the manufacturer realizes its full value, but in the form of filling waste it is practically worthless. A manufacturer can easily calculate the amount of this loss for his mill. If 400 pounds of cotton filling waste per day is made in a mill and the yarn is worth 20 cents per pound, the loss from this waste amounts to $80.00 per day. In the case of woolen and worsted yarn, the loss is still greater because the yarn is more expensive and usually coarser than cotton. The loss from filling waste in our textile mills reaches stupendous amounts every year and effective means of reducing this waste promises large returns to the manufacturer.

One method of accomplishing this object is to use longer bobbins or cops and thus get more yarn in a shuttle. In this way, the number of changes of bobbins is much less and the waste is correspondingly reduced because there is a certain amount of yarn always left unused on the empty bobbin. In using long cops, many difficulties have heretofore been met, the principal one being the liability of the cop to break apart during the weaving process, and thus entail the loss of at least one-half, if not the whole, of the yarn on the cop. This liability to breakage not only increases with the length of the cop, but also with the speed of the loom, so that with the methods heretofore employed perfect weaving from cops was very difficult.

Mills using mule cops found that the yearly amount of their paper tube bills was very high, especially when cops with the regular long paper tubes on the present cop spindles were used. These cops must be forced on the cop spindles very tightly to prevent them from flying off when the loom is run at the desired speed, and when the yarn is run off, the empty tube is held so firmly on the present cop spindle that in nearly every instance —even if made of better quality paper—it has to be torn or cut off, causing delay and spoiling the tube, making it impossible to use it again. Some mills, therefore, have adopted a short tube cop in order to save the higher cost of the regular long paper tube, but this does not do away with the waste and raises the question whether it is not more expensive in the end than the regular long paper tubes, as these short tube cops are more del-

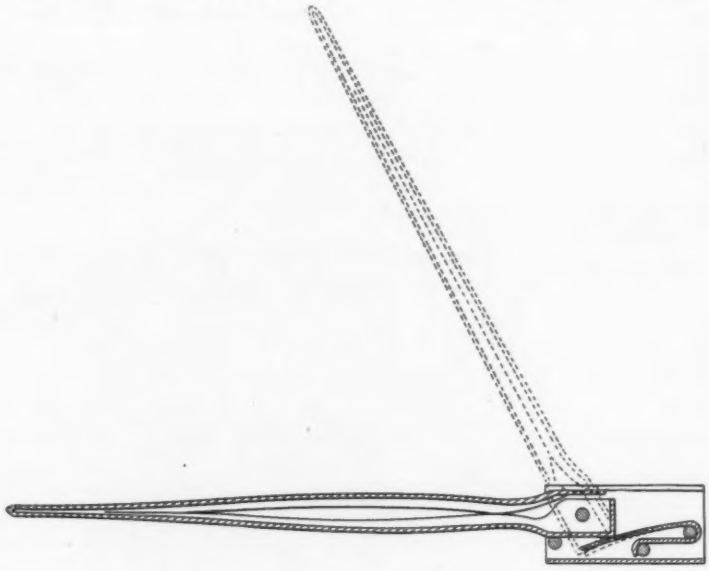


FIG. I.

icate to handle by the operatives, and when roughly handled (squeezed) or dropped, they break and cannot be put on the shuttle spindle. Furthermore, when a short tube cop is forced on the regular cop spindle, the weaver very often dislodges the yarn at once, thus creating waste at the outset. More often, however, the yarn is loosened, but to all appearances is solid on the cop. After being thrown back and forth several times across the shed, the yarn peels off, often causing a "smash," by having the loose yarn drag against the shed. Long cops effect a saving not only in weaving, but also in spinning, because the number of doffs is reduced in proportion to the increase in the amount of yarn in a set.

In order to make it possible to use long cops at a high loom speed with the greatest satisfaction, the American Textile Specialty Machinery Co., 363-373 Rider avenue, New York, have invented and are now manufacturing the "Neverslip" cop tube and shuttle spindle, which has been patented in all the principal textile manufacturing countries. We described the spindle in September, 1904. For the benefit of those of our readers who do not recall this description, we would say that the spindle, which is shown at Fig. 1, is made so that it contracts when lifted up to receive a full cop. When the loaded spindle is sprung back into the shuttle, a simple device expands the cop, causing a pressure on the inside of the cop, which holds the yarn firmly in position, and practically prevents the possibility of slipping.

Frequently the most valuable inventions are the simplest ones, and the simplicity of this spindle makes it unnecessary to go into a detailed description of it. Our readers, however, should not for this reason underestimate the great advantages which it possesses.

When using the ordinary tube on a solid spindle, the practice is to force the tube down as firmly as possible, in order to prevent it from getting loose during weaving. This entails considerable strain, which damages the tube and shortens its life. When the "Neverslip" spindle is used, however, it is not necessary to force the tube on the spindle because the pressure is obtained when the spindle is sprung down into the shuttle. When raised again to remove the empty tube, the latter slips from the spindle without difficulty. In this way the wear on the tube is greatly reduced, and its life correspondingly prolonged. Manufacturers of the "Neverslip" spindle and tube state that a tube can be used indefinitely on the "Neverslip" spindle.

In addition to the spindle the same company manufacture the "Neverslip" cop tube shown at Fig. 2. As will be seen from the illustration, a portion of the surface has a "retainer," which serves to hold the yarn more firmly in position. Thus by the use of the "Neverslip" spindle and tube the yarn is held as firmly in place in the shuttle as is the case with a corrugated wooden bobbin fastened in the shuttle by so-called ear-clips in the ordinary way.

FIG. 2.

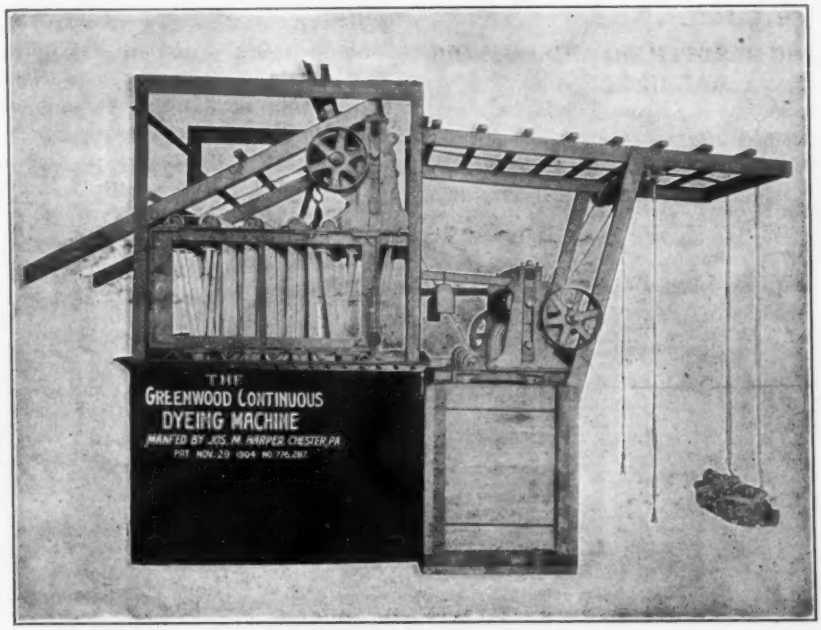
We are confident that the merits of this spindle and tube will be evident to every practical man who understands the principle on which they are based. The manufacturers, however, are able to refer to practical tests of the spindle and tube in some of the largest mills of this country. The manager of one of these mills states the following facts regarding the use of the "Neverslip" shuttle spindle and tube in their works: At the present time they have 200 looms running, on which the "Neverslip" spindle and cop tube are used, and are spinning enough yarn to supply the looms with 12 to 15 pounds of worsted filling per day per loom. The cops are 7 3/4 inches long, and the yarn is woven directly from them. The looms, which are running 140 picks per minute, weave 72-inch goods. The spindle and tube have been in use in this mill for nearly a year. Previous to their adoption, it was necessary

to wind the filling from cops to shuttle bobbins, an operation which the mill manager estimated to have cost 5 cents per pound, or 60 cents per loom per day. On the 200 looms this would amount to $120 per day, all of which has been saved by the use of the "Neverslip" combination. The manager states that weavers prefer the cops to the bobbins, because they run longer, and with them there is less liability for imperfections to be made in the cloth. He adds that while the tubes cost more than the old ones, they can be used as many as twenty times and with good care longer. In this way the final cost for tubes is much less than under the old system. He adds that in his opinion their use of tubes as long as 7 3/4 inch on looms running 140 picks per minute on 6/4 goods is probably unequaled in any other mill at the present time.

Orders are being placed for the "Neverslip" spindle and tube by the leading textile mills. Next to the orders from the United States, the demand from Great Britain is especially satisfactory. Further information regarding these very interesting devices can be obtained upon application to the manufacturers.

THE GREENWOOD WARP DYEING MACHINE.

About a year ago the Harper Manufacturing Co., Chester, Pa., installed the first of the Greenwood continuous warp dyeing machines. These have since been uninterruptedly in operation and given such satisfaction that several of the original purchasers have placed orders for duplicate machines. The claims for the Greenwood machine, which is shown in the accompanying illustration, include uniformity of shade, large production and adaptability to a wide range of work. It has successfully handled yarn from 2/14 to single 50s, the ends varying from 375 to 2,000. Warps of any length may be dyed in the machine as the process is continuous. The single capacity is 3,000 yards per hour, but by doubling the warps the production can be increased to 6,000 yards. There are practically five runs in one operation, the warp remaining two minutes in the dye. Following are a few of those using the Greenwood machine:—



THE GREENWOOD CONTINUOUS WARP DYEING MACHINE.

Fairmount Dye Works, 24th and Green Sts., Philadelphia, Pa.; Jos. Greer, Frankford, Philadelphia, Pa.; Hind & Harrison Plush

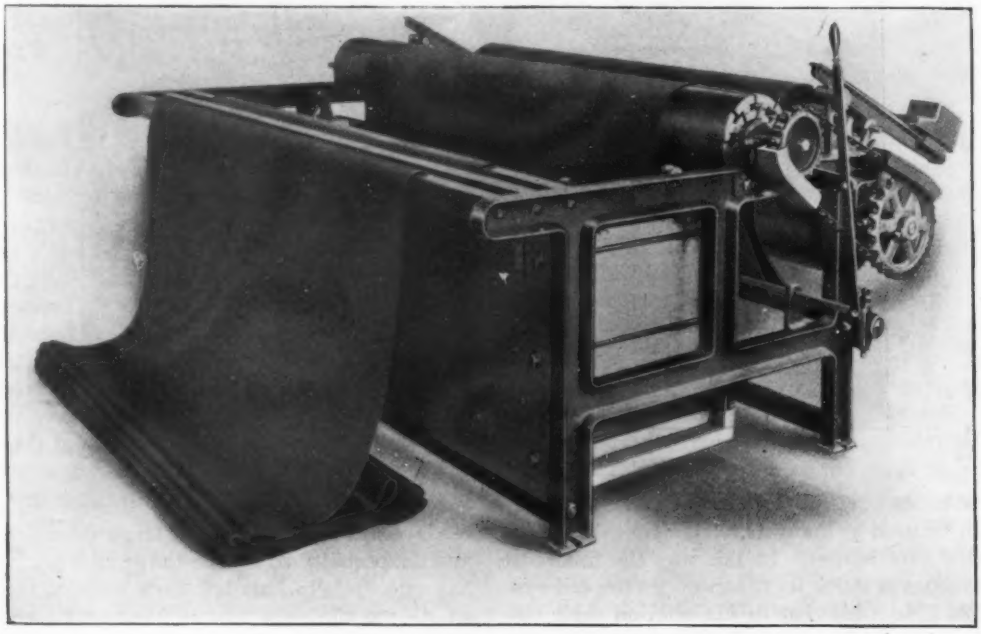
Co., Clark's Mills, N. Y.; Amoskeag Mfg. Co., Manchester, N. H.; Miller & Plette, Lenni, Pa.; Germania Dye Works, Allegheny Ave., Philadelphia. The Fairmount Dye Works ordered their first machine in November, 1904, and in July, 1905, placed an order for a second machine. So thoroughly are the builders convinced of the merits of the Greenwood machine that they offer to place the machine on thirty days' trial, to be returned at the expense of the builders if not satisfactory.

A BOILING STRETCHING AND ROLLING MACHINE.

Woolen and worsted fabrics frequently require a treatment during the wet finishing process to remove wrinkles and increase the solidity of the fabric. This may be accomplished by steam blowing or boiling the cloth when wound on rolls or cylinders. The term "boiling" refers to treatment in hot water, which is seldom, if ever, brought to a boil for this process. For many fabrics steam blowing is too severe, as it is liable to strip the colors, and in such cases "boiling" or crabbing must be employed. To meet the requirements of an all around boiling machine giving a large production, the Parks & Woolson Machine Co., Springfield, Vt., have designed and built the machine shown in the accompanying illustrations. It is of a novel construction and intended primarily to smooth out the cloth for the nappers and gigs, and has been found a great convenience at other stages of the finishing process.

When there are creases, wrinkles, or turned over selvages, it is impossible to raise the nap evenly at such points, unless these faults are removed.

After the pieces come from the fulling-mills and extractors, this machine puts them into condition for face finishing, by rolling them into hard, smooth rolls. The stretching of the cloth during this process tends to counteract any excessive shrinkage that may be due to over-fulling.



THE PARKS AND WOOLSON BOILING MACHINE.

Cloth that has laid around for a long time and got into bad shape is improved by being run through this machine before being sent to the next operation. The lustre and feel of face finished goods can be improved by this process as a preparation for drying.

Kerseys, beavers, broadcloths, coverts, worsteds, ladies cloths and many other fab-

rics require this machine. It frequently effects a saving in time in other operations, and improves the finish of the goods.

The cloth first passes through the wooden tension bars shown in front. This holds it tight for the other operations. It then passes through the hot water, beneath two rolls in the bottom of the tank, to soften and condition it for stretching and straightening.

The power driven stretch roll in the center of the machine pulls the cloth from the tank and at the same time gives it a preliminary stretching. From here it passes around a right and left screw threaded brass roll that revolves in the same direction, but at a surface speed much greater than the speed of the cloth. This smooths the surface of the goods and straightens out the edges so they will not turn under in the final roll.

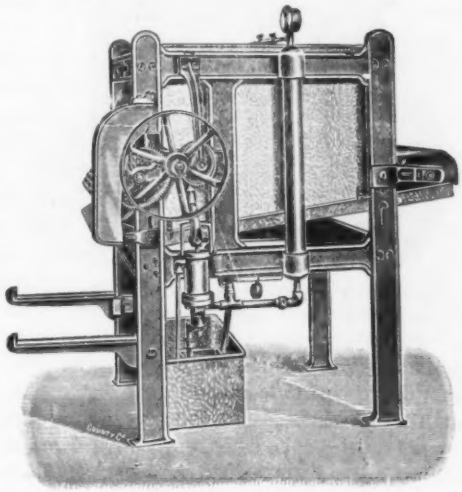
The cloth is now drawn straight from the screw threaded roll by a large power driven rolling up stretch roll. The cloth has a long contact on this roll, about half encircling it, and the winding roll rests on top at the point of widest stretch. The long firm grip that this rolling up stretch roll gets on the cloth transfers the whole stretch directly and continuously to the winding roll along the line of contact between them. The stretching and rolling are therefore done simultaneously and at the same place. The cloth has no chance to contract again as occurs when passing from a stretch roll to a solid rolling up drum some twelve to eighteen inches distant. This feature of the machine is considered of great value.

The handling of the weights that press the winding roll on the stretch roll drum is also novel. These weights may be easily slid back by hand, the lever arms automatically throwing themselves up, leaving the completed roll free to be taken away. In starting anew the winding roll is laid on the stretch roll drum, and the levers and weights are pulled down. The lifting of the heavy weights is thus avoided and time is saved.

The stretch rolls are a new pattern, designed for easy running, long wear and effective stretching. The slats are of clear pine, as this will resist rotting and warping much better than will hard wood. They are mounted on bronze shoes running in bronze heads. No rust stains can come from them. The boiling tank is furnished with brass rolls running in bronze bearings. If a coil of perforated steam pipe is preferred to the boiling tank it can be furnished instead. A brush with two adjustable contacts may be added to this machine when built to order.

AN AUTOMATIC YARN CONDITIONING MACHINE.

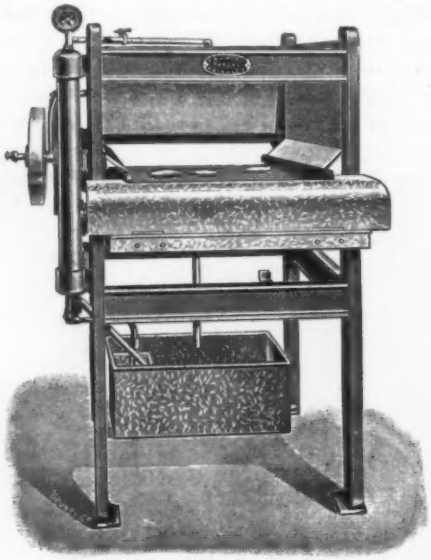
At the recent meeting of the New England Cotton Manufacturers' Association, William D. Hartshorne, of the Arlington Mills, Lawrence, Mass., stated that by careful experiments covering a period of ten years he had found that the moisture in worsted yarn exposed to the ordinary conditions of the atmosphere varied from 7 to 35 per cent. of the absolutely dry weight, and that there were occasional variations of 15 to 19 per cent. in 24 hours. This shows the importance of conditioning yarn so that sales may not be based



AN AUTOMATIC YARN CONDITIONING MACHINE (OUTSIDE VIEW).

on the weight of the material containing either a deficiency or an excess of moisture. In order to bring textile materials to the proper degree of humidity an apparatus is required by which moisture can be imparted to the stock in any desired degree. To obtain this result the automatic machine shown in the accompanying illustration was invent-

ed some years ago in England and is now in extensive use there for all kinds of textile materials. Arthur Stead, 227 Chestnut St., Philadelphia, Pa., is introducing it into this country, and because of the slight attention at present given to this important process he will supply a pressing want is American mills. It is compact, occupying a floor space of only 12 square feet. It can be regulated to deliver to the yarn whatever degree of moisture is required and when once adjusted works automatically. The material to be treated is placed on a traveling apron and passes under



AN AUTOMATIC YARN CONDITIONING MACHINE (INSIDE VIEW).

a humidifier, by which the moisture is delivered first to one side of the layer of yarn and then to the other. The degree of humidity depends on the speed of the apron. The machine will handle yarn on any class of bobbins, spools, cops or tubes. This machine is in use in several of the largest worsted mills of this country and is giving complete satisfaction.

In the last two years about 5,000,000 mulberry trees have been planted in Argentina, which has now about 10,000,000 of such trees. The production of raw silk will eventually become an important product of that country.

DOUBLE BOBBIN BORING AND REAMING MACHINE.

The accompanying illustration shows the double spindle bobbin and spool barrel boring and reaming machine built by the Defiance Machine Works, Defiance, Ohio. It is used for boring and reaming the blocks from which bobbins and spools are made, and prepares the work for the turning lathes. Previous to the invention of the machine the work which it does required three processes, one for boring and straightening the hole and two for reaming. With the new machine but two operations are necessary, one

THE DEFIANCE BORING AND REAMING MACHINE.

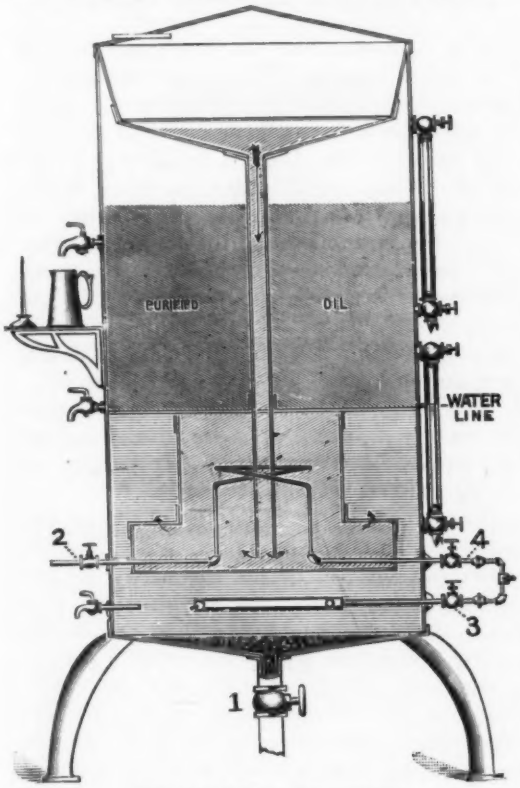
for boring from the solid and one for reaming and finishing, all at one setting of the stock in the chuck. It is claimed that a much finer quality of work is obtained with a greatly increased production.

The boring and reaming spindles of steel run side by side in long self-lubricating bearings, and they are provided with self-centering universal chucks to hold the bits true. The boring bit is provided with sufficient clearance and so constructed that true, straight holes can be bored up to 18 inches deep, without backing out, which covers the longest bobbin work. The reaming tool is also of special design. It is made to suit the exact shape and size of the finished hole, and they are intended to do any kind of counter boring; in fact, finish the hole in any kind of bobbin, spool or handle work complete.

This machine covers the entire field of boring and reaming bobbins, spools, handles, etc. and has sufficient capacity to supply several modern turning lathes.

THE Mc CLELLAND OIL PURIFIER.

On every hand we find the greatest efforts directed toward the prevention of waste, and especially as this occurs in the care and operation of machinery. The item of oil is an important one in this connection, and various methods have been devised whereby oil may be reclaimed by mechanical means after having served its original purpose, and so made available for use again. The reduction in the oil bill which has been effected



THE MCCLELLAND OIL PURIFIER.

in this way represents a considerable saving. More than this, oil from which all foreign substances have been eliminated by means of purification before being used at all, ensures an appreciable economy in the wear and tear and consequent life of the machinery itself.

The McClelland improved oil purifier is claimed by its users to offer the most practicable and desirable means of oil purification. The sectional view on this page is largely self-explanatory, but we may add that connection should be made at valve 1 with the sewer, and at 3 and 4 with the steam, the exhaust connection being made at 2.

The operation is decidedly simple. The purifier is filled with water to one-third its capacity, which is gently warmed by steam at 4. The impure oil is thrown into the top chamber, A, and passing by gravity through a strainer, B, gradually finds its way into and down the vertical pipe, C, which is in the centre of the tank, mixing with the water, D, in the bottom.

The inverted bell prevents the dirty oil in D from rising to the top of the water, while the heat from the steam coil forms fine oil globules from the mass which gently rise as cream rises on milk. The sediment, grit, dirt and all impurities heavier than the water are readily precipitated and drop to the bottom.

From this chamber, D, the oil passes through outlets at the bottom as shown by the two small arrows, into chamber, E, where it is washed by passing through the water. Around the outside and flush with the top of the bell is a wire gauze screen which prevents such impurities of the same specific gravity as the oil from rising with it into the storage reservoir above, marked "Purified Oil."

The McClelland oil purifier is constructed on strictly scientific principles, and many of its features embody improvements suggested by engineers of wide experience in such matters. The body of the machine is of heavy rolled galvanized iron with a patent seamless bottom resting upon cast iron legs.

The fittings are of brass and the oil gauge self cleaning. The McClelland device not only purifies oil as received in the original package, but removes all injurious substances which may accumulate from use in machinery so that pure oil is constantly on hand.

It should be remembered that filtered oil cannot be used over and over again no matter how clean it may seem to be, and that therefore a filter is not an oil saver nor an oil purifier. The McClelland machine is not a filter. It is made in two sizes, to hold one or two barrels as desired. Messrs. Patterson, Gottfried & Hunter, Ltd., 150 Center St., N. Y. City, will be pleased to send booklet containing full particulars on request.

A NEW THRUST BEARING.

The accompanying illustrations show the latest development in the way of thrust bear-

FIG. 1.

ings used on "The Reeves" variable speed transmission, made by Reeves Pulley Company, Columbus, Indiana.

FIG. 2.

Fig. 1 shows the bearing assembled ready to go on the transmission shaft.

Fig. 2 shows the yoke with all parts removed.

One of these bearings is placed on the outside of each disc, and consists of a split cage with six pockets, in which the steel rollers run. The outer end of each roller is spherical to conform to the interior wall of the yoke, thus maintaining the alignment of the rollers regardless of wear. The cage acts as a separator between the rollers, and, owing to the fact that it is made in halves, may be removed or replaced without disturbing other parts.

IMPROVED REGRINDING VALVES.

The Lunkenheimer Co., manufacturers of the well-known high grade Lunkenheimer engineering specialties, have made a number of desirable improvements on their regrinding valves. The changes, however, are not at all radical, as the valve has been in use for half a century and has proven itself to be of the correct design, having given general satisfaction wherever used. The manufacturers have, however, increased the weight of the valve, not because the thickness of shell was insufficient, but as an additional precaution against rough handling.

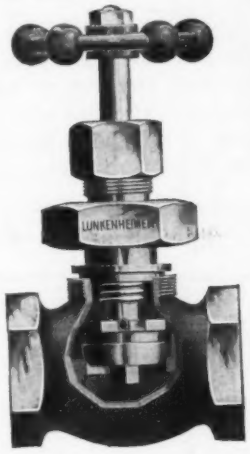
The medium pattern valves are guaranteed to stand a working pressure of 200 pounds per square inch; the extra heavy pattern up to 350 pounds per square inch.

They have also altered the shape of the valve, which not only makes a good appearance, but also increases the area through the valve, permitting an unobstructed passage, the area being more than equal that of the connecting pipe. To insure a perfect and strong joint between the pipe and valve, the pipe threads have been made considerably longer, thereby overcoming the danger of stripping threads which so often happens owing to rough and unskilled workmanship in attaching.

All sizes of the valves now have lock-nuts on the hand wheels which facilitates the taking apart and assembling of the valve for repairs. Referring to the sectional illustration, it will be noticed that the hub which carries the operating stem is secured to the body by a union connection, which, in turn, screws over the shell of the valve body. By means of this construction it is impossible for the

hub and the body to become corroded, as the thread which holds the union ring to the body is protected at all times from the action of the steam, the joint being made between the flange on the hub and the neck of the body. This connection also acts as a tie or binder in screwing over the body and tends to make the valve rigid and strong.

The disc, A, is held loosely to the stem, F, by means of the lock-nut, J, and therefore will adjust itself to the seat very readily and a tight joint can be relied upon. The stem, F, is fitted with a very strong, durable and long thread and the hand wheel is of ample diam-



eter to insure the easy operation of the valve.

To regrind the valve, the bonnet ring is unscrewed and the trimmings are removed from the body. A wire or nail is placed through the lock-nut and stem, a little powdered sand or glass and soap or oil are placed on the disc and the trimmings are again placed in the valve and reground. The bonnet has a small rim or projection on the bottom, which acts as a guide on the inside of the valve neck while regrinding. The seats in the valve-bodies are very small when the valves are sent out from the factory, which permits of considerable regrinding and is considered an important feature.

The valve can be packed under pressure when open or closed. To pack while the steam is flowing through the valve, open it as wide as possible when the shoulder at the top of the stem thread will form a seat beneath the stuffing box.

The material is of the highest grade of bronze composition and the workmanship is in every respect commendable. Before being sent out of the factory, every valve is thoroughly tested and inspected; the stuffing boxes are packed and they are ready for immediate use.

The company have in connection with their plant a complete physical and chemical laboratory, which enables them to manufacture their products of such composition as are best adapted to withstand the chemical actions and strains to which the various products are subjected. The laboratories also enable the company to guarantee their products in every respect.

Official Measurement of Cloth.

Because of a disagreement with their employers over the length of the woven pieces, which had been indicated by round numbers, the weavers at Ballieul, France, have been out on a long strike, which has caused great loss on both sides. In order to prevent a recurrence of such unfortunate disagreements the town government of Ballieul has recently installed public measuring establishments where cloth can be measured under official supervision and certificates issued to satisfy both parties to a dispute regarding the length of pieces. Such a service has long been in use in Roubaix, where five measuring bureaus are in charge of a sworn director and situated in different parts of the city where they are readily accessible to the manufacturers and workers. For measuring cloth at the bureau the fee is 2 cents (10 centimes) per piece; and if the measurement is made outside the charge is 1 cent for 5 1/2 yards (1 centime per metre). L'Industrie Textile states that 149,250 pieces were measured at Roubaix bureaus in 1902, and 120,650 pieces in 1903; outside: 2,290 pieces in 1902, and 4,005 pieces in 1903. Each year the standards of measurement are publicly verified at the city hall.

In 1904, 54,073 tons of Manila hemp were imported into the United States at an estimated value of $10,510,473.

Dyeing, Bleaching, Printing, Etc.

COP DYEING.

BY AN OBSERVER.

About twelve years ago an agent for a firm who dyed cops said to the writer: "Give up trying to use these dyed cops they are the cause of endless claims for damaged goods." But so apparent has it always been that a great saving in cost would follow if cops could be dyed and used without the expense of reeling, rewinding and a great loss in waste and the making of many objectionable knots, that ceaseless efforts have been made, which have resulted in making cop dyeing a complete success and thus effecting a saving in cost of from six to eight cents per pound.

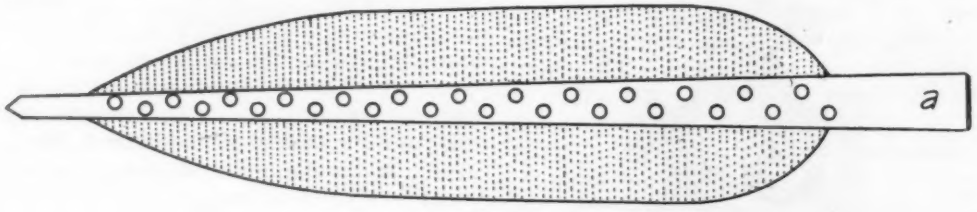


FIG. 1.

A manufacturer told the writer a few days ago that now he has dyed cops he has only ten hank winders, where he used to have one hundred. The ease with which most of the aniline dyes can be mixed together and used with the same mordants makes it possible to dye in the cop nine out of every ten of the colors used.

Early attempts to dye cops failed, because no amount of pressure could make the dye penetrate evenly to the centre of the cop. The secret of the present success has been the adoption of a hollow cop skewer, made of light non-corrosive metal and so perforated with holes that the dye liquor obtains free access to the yarn in the middle of the cop. The skewered cops are placed in a frame with holes to receive the open end of the skewer. This frame is then slid down grooves in the centre of the dye vat. The dye liquor enters the tube at a, Fig. 1, and a rotary pump is placed so as to draw the dye liquor from that half of the dye vat in which the cops are placed. This draws the dye liquor to the outside of the cop. Fig. 2 shows the position of the cops in the dye vat. A plate, b, holds the end of the skewer so that none of the cops can get out of place. A good many spare cop holding frames are necessary so that the dyeing is not stopped for want of cops being skewered and put in the frames.

It is convenient to have the dyeing vats all one size, so that the cop holding frames can be put into any vat or changed from one to another. The dye vats are made of various sizes to dye from 300 to over 2,000 pounds per day of 10 hours, and will dye from 150 to 1,200 cops each time. Simple colors such as benzopurpurine can be dyed in 12 minutes so that including the time taken to change the frames four sets of 1200 weft cops can be dyed in one hour.

The vats are made of iron, brass or bronze, to suit the dye wares they have to hold. They are usually placed in a battery, so that a traveling crane running over all can lower the frames of cops into any dye bath, or transfer them from one to another.

When dyeing compound colors, the cops may be mordanted in one machine and washed and dyed in another. In large works each machine is kept on a separate color, so that the dye liquor is not run off, but strengthened up for the next run. Where only single lots of cops are dyed, the quantity of dye that has been found by experience to be sufficient is used, so that the dye liquor becomes exhausted when the cops are sufficiently dyed.

With these machines the quantity of work done, the lessened cost of dye wares and the small amount of labor required reduces the cost of dyeing to a minimum, and as only a few hours are necessary to dye cops and have them ready for the loom, this is found to be an advantage. It speaks volumes for this system of cop dyeing that persons who first installed two machines have afterwards ordered many more.

The dye bath is open at the top, so that the dye can be inspected for temperature and strength at any time. The bath may be used cold or at the boil. In the larger machines a rotary pump keeps about 200 gallons of dye liquor per minute circulating through the cops. When dyed, the cops are lifted out of the machine only about two inches at a time, so that the excess of moisture is extracted. The skewers are taken out of the cops and set upright on wire cloth trays with about three-quarter inch mesh, and then put in the stove to dry.

Other cop holding frames are used for larger cops of twist yarn and others again for cheeses, which are rolls of yarn, cross wound 5 inches by 4 inches, on perforated spindles weighing about one pound each. These cheeses are placed on the four sides of a hollow box, 24 on each side, 96 in all. The dye liquor enters the yarn on the outside of the cheese and is drawn through the perforated tube on which the yarn is wound and then into the hollow center of the box to the pump. By reversing the pump the dye liquor may be circulated the opposite way. The dyed cheeses are afterwards put in a beaming frame and arranged to suit the design of the cloth. The beams made from these are afterwards tape sized and the yarn put on weavers' beams, thus saving the cost of dressing the warps.

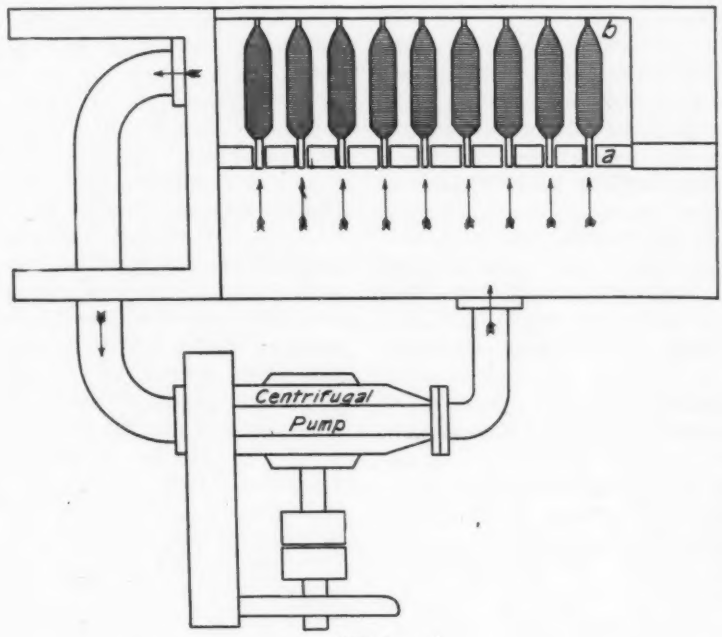


FIG. 2.

Special machines are made for dyeing cops with indigo.

Cop and cheese dyeing have given rise to experiments for dyeing and bleaching yarns on large beams.

The barrel of the beam is perforated with small holes like the cop skewer, and the dye liquor is circulated through the yarn on the beam. Dyeing on the beam has not as yet been very generally adopted, though it is done to some extent. Bleaching on the large yarn beam has been quite a success, and we

know one firm which has done this uninterruptedly for the last two years. This bleached yarn on a number of these beams is then run off together at the tape sizing machine, on to weavers' beams, saving the cost of dressing.

Cop bleaching is where it has been for many years. Special machines are made for cop bleaching and they do their work satisfactorily, but their general adoption has not been taken up by the trade. Chlorine and acids penetrate the cop easier than dyes and the bulk of cops bleached are yet done in small bags by the ordinary bleacher along with bundle yarn. The hollow metal skewers cannot be used for bleaching, as they are so soon eaten away by the chlorine and acids.

FINISHING COTTON FLANNELS.

The goods are first napped lightly but thoroughly. At least two runs should be given on each side. It is better to give the goods more runs, but working more gently so as to raise a thick, uniform nap. The goods should be dried on a tentering machine to avoid pasting the nap as with the cylinder dryer. The finishing composition is made as follows:

3 parts wheat starch
2 parts potato starch
1 part Irish moss
4 parts Glauber salts
½ part Turkey red oil

10½

This is dissolved in about 50 gallons of water. The Irish moss is first soaked for a day and strained through a fine sieve. In warm weather 1 part of salicylic acid is added to prevent fermentation. The Glauber salts are added in order that the finished goods may retain a small percentage of moisture which imparts a soft, full handle to the fabric. After finishing the cloth is napped lightly with one run on each side. (Translated by the Textile World Record from Leipziger Faerber Zeitung.)

The export of wool from Great Britain was prohibited by law in 1662. The penalty for violation of this order was a fine of $15 for every pound of wool.

BLEACHING AND DYEING OF LINEN THREAD.

The bleaching of linen thread in order to obtain a white was formerly a tedious and lengthy process, as the natural color of the flax and hemp yarn, from which the linen thread is spun, is difficult to remove without injuring the material. On this account the "grass bleach" was generally used. The yarn was spread out on the grass, sprinkled with water and the sun's rays allowed to act. The sprinkling was always repeated, until the white was good enough, which took a long time. Today, however, this method is not generally employed. With the technical help which the bleacher, at the present time, has at his command, it is now possible to produce in a much shorter time an irreproachable white, and to discard entirely the grass bleach. It is obvious that the yarn or cloth ought in no way to suffer, which it does not with correct methods of working and with the necessary experience on the part of the managers of bleach works. In the first place, an iron vessel is required in which the yarn can be boiled under pressure. The goods are placed in this and the soda lye pumped over them. For 100 lbs. of material there is used 4 1/2 lbs. of soda ash, or 1 gallon of soda lye, at 76 deg. Tw. This is allowed to boil from five to six hours at a pressure of two atmospheres. Previous to this the yarn must have been washed and soaked for several hours, or overnight, in lye and soap solution, which has a considerable influence on the resulting character of the white.

After having boiled for the required time the liquor is run off and cold water is run in until it runs clear. After this comes the second boil. For this use for 110 lbs. of material 2 per cent. of soda ash and 2 per cent. caustic soda. The boil occupies five hours. After a thorough washing comes the third boil for five or six hours. After draining and washing, the yarn is placed in bleaching powder solution of 3 deg. Tw.; the solution must be freshly prepared and must contain no undissolved particles. The yarn is removed after two hours, washed and soured with H_2SO_4 at 1/2 deg. Tw., and then well washed, boiled with soap, and washed. The yarn is now

given two treatments with bleach, each for one hour, washed, soured, and again washed, and then blued with Ultramarine. It is better for the soundness of the yarn if electrolytic bleach can be used. If no electrolyzer is at hand, the bleaching bath is produced by dissolving 55 lbs. of bleaching powder in water and making up to 25 gallons. A solution is then made of 33 lbs. of sodium carbonate in 12 1/2 gallons of water (boiling), 6 1/4 gallons of water added, and this solution mixed with the bleaching powder solution and allowed to settle over night. The clear solution is drawn off and the precipitate washed four times with cold water and the whole liquor made up to 130 gallons, which will stand at 6 deg. Tw. The water still contains lime, and so 1 or 2 lbs. of soda are added to precipitate the rest of the lime as calcium carbonate. The solution, which is now alkaline, may be neutralized by adding 1 1/4 lbs., of H_2SO_4 to every 100 gallons of liquid.

For the preparation of linen thread for dyeing, the previous boiling is necessary. For dark colors a boil with 5 to 10 per cent. of soda is enough, while for bright shades a half bleach must be given. The cotton dyestuffs generally find employment in dyeing linen yarn, but it must be remembered in dyeing that the fibre is hard and not easy to dye through. On this account dyestuffs must be used which dye slowly. In using the substantive dyestuffs, the quantity of salt is decreased and the quantity of soda increased. In dyeing with the basic colors the material is steeped in tannic acid, which should not be too strong, at a moderate temperature, and then dyed with the addition of acetic acid or alum to the dye-bath. In dyeing with the sulphur colors, the quantity of salt is decreased, while on the other hand the addition of sodium sulphide is increased. The addition of Turkey-red oil is also recommended. For green, cream, yellow, orange, olive, and brown the principal bright substantive dyes are used. The yarn must be well washed after dyeing with sulphur dyes. For blue the useful Pyrogene Indigo is employed, as this dyestuff comes next to indigo in purity. For a cheap black Oxydiamine Black BG and Diamine Black are used. When a black faster to washing and light is required the linen is dyed with Diaminogen B, diazotized and developed with p.-phenylene-diamine and resorcin. A fine black is produced with 7 per cent. Katigen Black SW, 14 per cent. sodium sulphide, 8 per cent. of soda, 20 per cent. of Glauber's salt for the first bath. The yarn is worked for one hour, keeping it below the surface.—Farber Zeitung.

MERCERIZING AND BLEACHING SKEIN YARN.

The process of mercerizing as discovered by John Mercer in 1848 was originally used for preparing cotton for coloring, as it increased the affinity of the material for the dyestuff. It was observed that cotton shrunk from 20 to 25 per cent. in length during mercerizing and gained from 4 to 5 per cent. in weight. Only within recent years was it discovered that cotton mercerized under tension acquired a high lustre. At the present time the term mercerizing is applied only to the later modification of the process. In this article it is proposed only to refer to the working process for the production of the highest lustre.

Ply yarn is almost exclusively used for mercerizing because it is necessary to give single yarn an excessively hard twist to withstand the strain during the process. Even when this is done a very inferior lustre is obtained. The process invented by Bourcart of Remiremont for mercerizing single yarn consists in mercerizing the slubbing which has previously been twisted very hard, then taking the twist out and spinning it into yarn. This method, however, has been used to but a slight extent.

The lustre of mercerized yarn depends upon the quality of the yarn itself as well as the handling during the mercerizing process. The best lustre is obtained on Egyptian cotton, which resembles silk when properly treated. The best grade for this process is Mitafifi, while the other grades, Abassi, Joanovich, Afritti and Skarto give an inferior lustre. Combed yarn takes a better lustre and less mercerizing than carded yarn, in fact, the latter is used but little for mercerizing the short fibres and impurities making it impossible to get a good lustre. The twist

of the yarn plays an important role in this process. Too much twist in the single as well as in the twist yarn reduces the lustre; the reduction of the twist increases the lustre, but reduces the strength. The twist must be adjusted at a point where the shrinking power is below the breaking point. The following formula for adjusting the twist is given by Bourcart:

Twist (turns per inch) in 2-ply yarn = .707 × Twist in single yarn.

Twist (turns per inch) in 3-ply yarn = .577 ×Twist in single yarn.

the spinning, twisting and weaving processes requires that the yarn should be twisted harder than the twist required for the highest lustre in mercerizing. Furthermore a hard twist makes the yarn less fuzzy than when twisted soft and not singed. If mercerized yarn is to be used for warp it is generally necessary to twist it fairly hard to avoid sizing. For this reason it is impossible to give a fixed rule for determining the twist of mercerized yarn. The amount of the twist must be left to the judgment of the manufacturer. The lustre of the yarn is

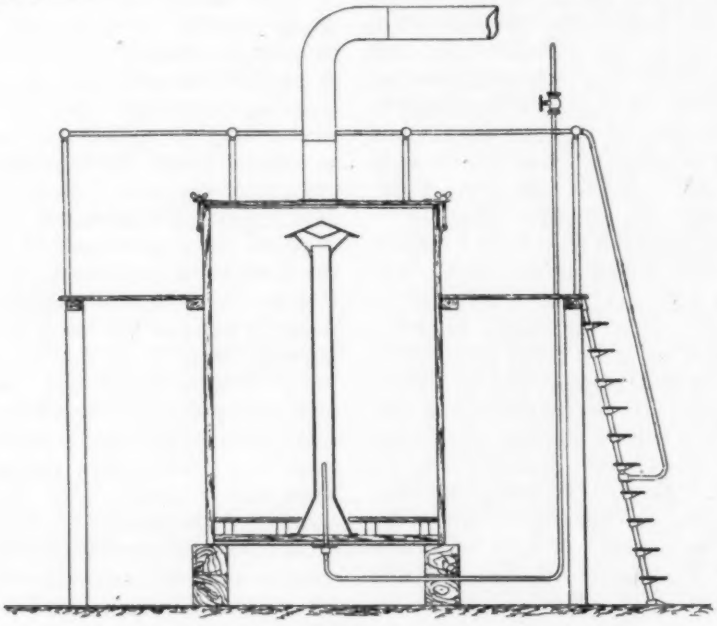


FIG. I.

This formula enables one to calculate the number of turns to give the ply yarn for any given number of turns in a single yarn in order to obtain the best results in mercerizing. The highest lustre is obtained by having the twist of the single and ply yarn in proportion. The softer the twist of the single and ply yarn the higher will the lustre be, because the fibres lie nearer parallel to the axis of the thread. When twisted hard the fibres assume the form of a screw thread, producing shadows which reduce the lustre. In practice, however, it is for various reasons generally found advisable to twist the yarn fairly hard. The successful working of

greatly enhanced by gassing, a process which removes all the projecting fibres.

The mercerizing process consists of boiling off, extracting, mercerizing, souring, washing, extracting and drying. The boiling off process is for the purpose of removing as much as possible of the foreign substances, which amount to about 5 per cent. of the total weight of the cotton. The yarn is boiled either in a closed kier under a pressure of 1 1/2 to 2 atmospheres or in an open tank. The closed kier is much more economical than the open tub, both in respect to steam and time; from two to three hours is required with the kier as compared

with five or six hours with the open kettle. The skeins are arranged in five-pound bunches and packed closely in the kier or kettle.

Fig. 1 shows an open kettle in which the material is firmly held under the liquor by weights. Care should be taken to avoid the use of oak in the construction of the kettle as it is likely to cause violet spots on the yarn. If it is desired to have the yarn retain the natural color of the cotton it is boiled only in clear water. If it is to be subsequently bleached it is boiled in a solution of

Solution	5° B			10° B			15° B			25° B			30° B			35° B		
Duration in Minutes.....	1	10	30	1	10	30	1	10	30	1	10	30	1	10	30	1	10	30
Temperature F.																		
35°	0	0	0	1	1	1	12.2	15.2	15.8	19.2	19.8	21.5	22.7	22.7	22.7	24.2	24.5	24.7
64°	0	0	0	0	0	0	8	8.8	11.8	19.8	20.1	21	21.2	22	22.3	23.5	23.8	24.7
86°	0	0	0	0	0	0	4.6	4.6	6	19	19.5	19	18.5	19.5	19.8	20.7	21	21.1
170°	0	0	0	0	0	0	3.5	3.5	9.8	13.4	13.7	14.2	15	15.1	15.5	15	15.2	15.4

caustic soda and carbonate of soda, 3 1/2 pounds of each material being added for each 250 pounds of yarn. This solution removes from the cotton about 2 per cent. of its weight, consisting of pectin, cotton wax, fatty acids and albumen. After boiling, the cotton is cooled and extracted. Not over 20 to 30 per cent. of water by weight should be left in the cotton, otherwise the latter will not absorb the alkali solution sufficiently.

The alkali used for mercerizing is found

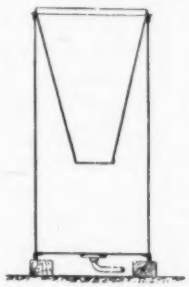


FIG 2.

in commerce in the form of concentrated solutions in carboys or in the form of cakes packed in wooden boxes. The latter form is to be preferred as the concentrated solution is more expensive. The solid alkali is dissolved in the apparatus shown at Fig. 2. The alkali is placed in a funnel-shaped receptacle at the top and is then dissolved quickly by pumping through it the old solution which has already been used for mercerizing. Another way of making the solution is to place the alkali in a perforated drum which is then immersed in the water or old alkali solution. The liquor is heated by dissolving the alkali and it is necessary now to cool it. This is done either by circulating cold water around the tank or by pumping the liquor into another receptacle and letting it fall for some distance in the open air. The solution should stand at 32° to 34° B, and be as cold as possible.

The following table shows the shrinkage (per cent.) of cotton yarn under various degrees of temperature and density of the solution:

After mercerizing, the yarn is treated in an acid bath solution at 1/2° B. This souring is absolutely necessary as the alkali exerts a very energetic action on the fibre. The amount of sulphuric acid in the bath is best determined in practice by litmus paper or by tasting. Generally one gallon of sulphuric acid is used for 1000 gallons of water. A thorough rinsing must follow the souring bath in order to prevent injury to the goods from the effects of the acid. After washing it is customary to test with the tongue to determine whether any acid remains in the fibre. The presence of acid can best be determined by testing the yarn by which the skeins are bound together as this binding thread is generally coarser than the regular yarn and consequently retains the acid longer. The yarn is next extracted and dried.

The yarn is kept under tension during drying, either in a drying room or on special machines. The drying room can be heated by the waste heat from the steam boilers or by the direct steam. Fig. 3 shows the ground plan for a mercerizing plant having a production of 550 pounds per day. The equipment consists of A, boiling off kettle;

B, extractor; C, skein bars; D, mercerizing machine; E, F, washing and souring tanks; G, revolving racks; H, drying machine; J, blower; K, yarn press; L, apparatus for dissolving alkali; M, pump; N, tank for alkali solution that has been used; O, yarn tables.

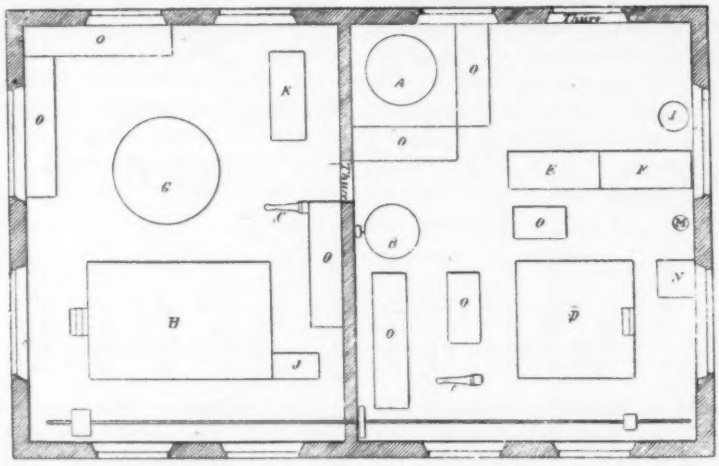


FIG. 3.

The pipe connecting the mercerizing machine, pump and tanks should be at least 1 1/2 inches in diameter because a smaller pipe is likely to get stopped up. The drying and mercerizing rooms are separated by a wall to prevent the heat of the drying room from raising the temperature of the alkali solution and thus injuring the lustre of the yarn. The floor of the mercerizing room should be made of cement and that in the dry room of wood, although these are not essential details. The mercerizing process increases the strength of the yarn, but reduces its elasticity. This is shown by the following figures giving the results of a number of tests of the same skein before and after mercerizing:

	Before mercerizing.	After mercerizing.	Before mercerizing.	After mercerizing.
Yarn number	2/30	2/30	2/40	2/40
Date of test	Mar. 12, '04	Mar. 17, '04	Mar. 12, '04	Mar. 17, '04
Average strength	15.7 oz.	21.4 oz.	11.2 oz.	15.7 oz.
Average elasticity	7 1/16%	5 5/16%	6 1/16%	4 15/16%
Increase in strength		36.39%		39.52%
Loss in elasticity		18.63%		21.46%

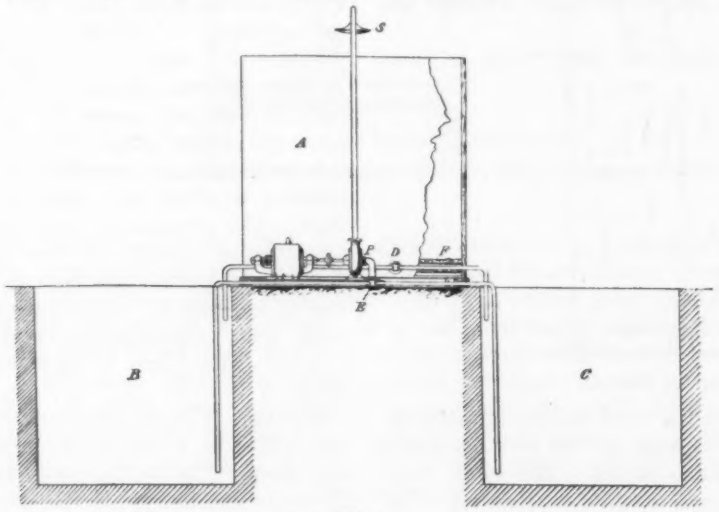


FIG. 4.

One of the most recent improvements in the mercerizing process is that of A. Karge which dispenses with the boiling-off process by the addition of various chemicals to the caustic bath. Another method of accomplishing the same result consists in immersing the cotton for several hours in a solution of carbonate of soda at 5° B and then mercerizing it.

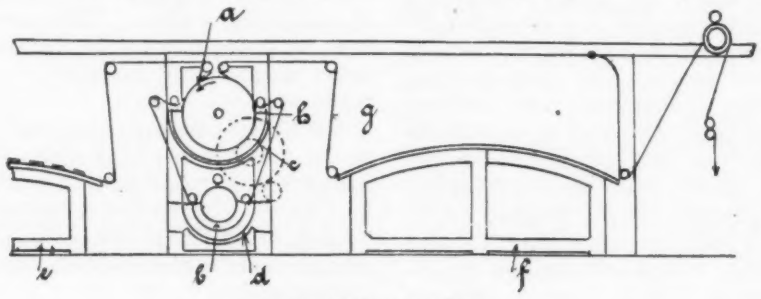
The yarn can be bleached either before or after mercerizing. One advantage of bleaching first consists in the removal of about 3 per cent. of foreign material which enables the caustic bath to work more energetically on the fibre, thus increasing the lustre. The disadvantage of this method is the danger of staining or spotting the yarn by the impurities which are carried into the mercerizing bath. An additional advantage, however, in first bleaching the yarn consists in the simplification of the whole process as one souring and washing process is made unnecessary. The different operations of bleaching after mercerizing are as follows: 1, bleaching; 2, souring; 3, washing; 4, extracting; 5, drying.

The mercerized yarn which is yet to be bleached is placed carefully in layers in a bleaching tank, then washed and afterward treated with chloride of lime at 7° B. for three hours, then washed for half an hour. The material is then soured for half an hour, and washed for another half hour, and dried.

Fig. 4 shows a bleaching apparatus consisting of a tank, A, with a false bottom, F, above which the yarn is packed. The material can be treated with either a solution of chloride of lime or acid, supplied by a three-way valve, E. The liquor is sprinkled uniformly over the yarn by means of the cap, S. By a suitable arrangement of valves the solutions are returned to the lower tanks, B and C.—(Translated by the Textile World Record from Leipziger Monatschrift fuer Textil-Industrie.)

WATER-PROOFING FABRICS.

A new process of water-proofing fabrics has recently been brought out by F. Sauerland, 32 Blumenstrasse, Goerlitz, Germany. The novelty of his method consists more in the mechanical arrangement of the water-proofing apparatus than in the formula which he proposes. The goods are first treated in the following preparation at 3 degrees Be.: 100 parts of aluminum, 160 parts of carbonate of lime, 100 parts of sulphate of aluminum, 15 parts of zinc oxide, 150 parts of sugar of lead. The goods are left in this preparation one hour, and then coated on both sides with the following preparation: 40 parts of paraffin, 20 parts of Japanese wax, 17 1/2 parts of stearin, 2 1/2 parts of Para rubber (10 per cent. solution.)



A WATERPROOFING MACHINE.

The machine for impregnating the goods with these solutions is shown in the accompanying illustration. Under each roller, a and b, is a trough, c, in which the water-proofing solution can be heated. The mixture of paraffin, stearin and Japanese wax is placed in trough, c, to which the rubber solution is added. In trough, d, a thin solution of rubber is placed. On each side of the rollers is a table, e and f, the surface of which can be heated. The cloth, g, is carried over the guide rolls, and over the preparing rolls to the table, e, on which it is dried. It then passes over water-proofing roller, a, where it receives on the face a coating of the water-

proofing material. It then passes over roll, d, where the back of the cloth is coated, and then passes to the table, f, where it is again dried, after which it is washed in a boiling solution of rosin soap. (Translated by the Textile World Record from Oest. Wollen Und Leinen Industrie.)

FINISHING CLOTH FOR BOOKBINDING.

At one time calf or sheepskin was exclusively used for binding, but now calico has to a large extent taken the place of leather. The colors used in the dyeing and finishing of the calico are divided into two classes, extra colors for printed goods and common colors for dyed goods. The colors should be very fast to rubbing, light and glue; it is also advisable that they should be fast to water. To obtain this latter property the cloth is sometimes varnished after dyeing, with ordinary varnish or celluloid dissolved in acetone or amyl acetate. This treatment also makes the colors fast to glue. Colors such as ultramarine, ochre, chrome yellow, guignet green, Prussian blue, etc., are often used for this class of goods. Alumnia hydrate is generally used with the soluble colors to form an insoluble lake. The following are some of the commoner printed or extra colors, all of which are made up to 32 galls. with water and boiled before using:

Red 3.—40 lbs. alumina hydrate, 2 1/5 lbs. Ponceau R, 40 lbs. fine white starch.

Red 11.—44 lbs. alumina hydrate, 12 ozs. alum, 3 lbs. Ponceau R, 40 lbs. fine white starch.

Blue 4.—22 lbs. Ultramarine EDN, 6 1/2 lbs. zinc oxide and 40 lbs. ordinary white starch.

Blue 5.—40 lbs. Ultramarine EDN, 44 lbs. white starch.

Green 17.—22 lbs. Silk Green paste (light), 13 lbs. alumina hydrate, 40 lbs. starch. Silk green is a mixture of Prussian Blue and Chrome Yellow. It should be kept as a paste because when once dried it loses its brightness.

Bronze 33.—40 lbs. Chrome Yellow, 22 lbs. Chrome Orange, 13 lbs. Ultramarine EDN, 4 1/2 lbs. Aniline Black lake and 40 lbs. starch.

Leather 39.—31 lbs. Ochre N, 2 1/5 lbs. Mahogany Brown, 4 3/4 lbs. Chrome Orange, 11 lbs. zinc oxide, 2 ozs. Ultramarine EDN, and 40 lbs. starch.

White.—33 lbs. zinc oxide, 1/5 oz. Ultramarine EDN and 44 lbs. starch.

The printing is done on a two-color machine, the rollers being engraved with fine lines or dots. It is necessary to print the cloth four to six times, or until it is sufficiently covered with the color. After each passage the goods are dampened and it is advisable to tenter them after the second or third passage.

After printing, the calico is finished with the following white filling: 79 lbs. white starch, 3 1/4 lbs. gelatine and 6 1/2 lbs. tallow or lard per 50 gallons. When the cloth contains a large quantity of mineral colors a quart of glycerine is added to lessen the hardness.

The finish is applied hot two or three times to the wrong side of the piece, which, after dampening, is rolled up and left for twenty-four hours. It is then calendered on hot friction rollers, until the finish is perfectly smooth, and the cloth when held to the light is quite opaque.

The dyed or common colors are applied to goods already dyed in the form of a colored filling, as follows: Violet 45.—The cloth is mordanted with 1.5 degrees Tw. sumach solution, fixed with tartar emetic, and dyed with 1 oz. Diamond Fuchsine, 1 oz. Violet 170, 1 pint acetic acid and 13 galls. water per 325 yards of cloth. The filling per 50 galls. consists of 70 lbs. starch, 18 lbs. farina, 6 1/2 lbs. gelatine, 13 lbs. alumina hydrate, 2 qts. sumach extract at 24 degrees Tw., 11 ozs. Fuchsine, 5 ozs. Violet 170, and 2/3 oz. Chrysoidine.

The finish is applied twice as above, then twice mixed with an equal quantity of the white filling, together with 1 lb. per 12 galls. of the mixture G. The mixture G contains 66 lbs. tallow, 44 lbs. lard, 22 lbs. cocoanut oil and 44 lbs. vegetable wax, melted together.

For dark shades the cloth is mordanted with sumach and iron salts, and the filling varied accordingly.

Red 88 is a cheap color obtained by dyeing

the cloth in a bath containing 6 1/2 ozs. Ponceau R and 1 lb. common salt to 5 galls. of water, and finishing first with 77 lbs. fine white starch, 4 1/2 lbs. gelatine, 55 lbs. alumina hydrate, 2 1/5 lbs. alum, 2 1/5 lbs. white glycerine and 2 1/5 lbs. Ponceau R, used alone and then with the addition of 1 per cent. of mixture G.

These goods are also calendered damp, but care should be taken that they are not too moist, as this causes the filling to come off on the rollers. When the goods are to be embossed, they should leave the calender before they are completely dried, or even be given a light steaming between calendering and embossing.

The embossing is done by passing the damp cloth between a paper roller and an engraved steel or copper roller under pressure.—Rev. Gen. des Mat. Col.

Color Cards.

Direct Prints with Immedial Colors; Cassella Color Co., 182 Front St., New York City.

A folder showing twelve samples of cotton piece goods which have been printed with the Immedial Colors with the addition of caustic soda lye only.

Immedial New Blue G Conc.; Cassella Color Co., 182 Front St., New York City.

A card showing two samples of raw cotton, four of cotton yarn and three of cotton piece goods, dyed with different percentages of Immedial New Blue G Conc., for each of which full working directions are given.

Toluylene Dark Blue G N; K. Oehler, Offenbach, Germany. Geisenheimer & Co., 189 Front St., New York City, American agents.

A card showing five samples of cotton yarn dyed with different percentages of Toluylene Dark Blue G N.

Cloth Yellow; K. Oehler, Offenbach, Germany. Geisenheimer & Co., 189 Front St., American agents.

A folder having four samples of raw wool, four of woolen yarn and four of woolen piece goods showing one and two per cent. dyeings of Cloth Yellow G and R. Full dyeing directions are given.

The poolah, or silk cotton tree, which grows in abundance in several parts of Southern India, is the well-known cotton coral, and it has other names, such as kapok fibre tree, red cotton, and Malabar semul. The silk from its pods is collected and sold exclusively for stuffing pillows and beds.

DYE RECIPES.

The following recipes appear in the Dyers' Supplement, which is issued each month by the TEXTILE WORLD RECORD. The Supplement contains the colored samples, dyed according to recipes given. The selection of samples is carefully made, and it is the aim to show shades which are of especial interest to the dyer, and which the requirements of the market demand. The Dyers' Supplement is a 16-page pamphlet, in convenient form for preservation Subscription price for the Dyers' Supplement $1.00 per year

Recipe No. 145.

Bluish Red on Woolen Cloth.

Azo Eosine 3 B on 100 lbs. woolen cloth. Prepare the dye bath with

½ lb. Azo Eosine 3 B.
(C. Bischoff & Co., 88 Park Pl., New York.)
3 lbs. Sulphuric Acid.
15 lbs. Glauber's Salt.

Enter at 140° F., bring to a boil and dye at a boil until the color is exhausted from the dye bath.

Azo Eosine 3 B is an easily soluble and level dyeing acid color, and will be found very useful in the dyeing of woolen piece goods.

Recipe No. 146.

Slate on Worsted Yarn.

Alizarine Fast Black S P Paste on 100 lbs. worsted yarn. Prepare the dye bath with

3 lbs. Alizarine Fast Black S P Paste.
(Farbenfabriken of Elberfeld Co., 40 Stone St., New York.)
3 lbs. Acetic Acid.
10 lbs. Glauber's Salt.

Enter yarn at 140° F., bring slowly to the boil and dye at a boil for one-half hour, then add

2 lbs. Sodium Bisulphate

and continue until the dye bath is exhausted, when

1 lb. Potassium Bichromate

is added and the boiling continued one-half hour longer.

Alizarine Fast Black S P Paste is very easily soluble in water, dyes easily level and possesses excellent fastness to milling, alkalies, acids, steaming and stoving, as well as good resistance to light. It is adapted to either the single or two bath process. It is particularly useful in the production of Oxford greys, slates, and in the production of compound shades.

Recipe No. 147.

Dark Brown on Cotton Yarn.

Katigen Black Brown B Extra Conc. on 100 lbs. cotton yarn. Prepare the dye bath with

9 lbs. Katigen Black Brown B Extra Conc.
(Farbenfabriken of Elberfeld Co., 40 Stone St., New York.)
18 lbs. Sodium Sulphide.
5 lbs. Soda Ash.
30 lbs. Common Salt.

Enter yarn at the boil and dye for one hour in the gradually cooling bath.

Katigen Black Brown B Extra Conc. is easily soluble and dyes very level. The direct dyeings are very fast to washing, boiling, alkalies, acids, cross dyeing, ironing and light, so that there is no necessity for after treating with metallic salts.

Recipe No. 148.

Green on Cotton Yarn.

Tetrazo Sulphur Green 3 Y on 100 lbs. cotton yarn. Prepare the dye bath with

10 lbs. Tetrazo Sulphur Green 3 Y.
(American Dyewood Co., 156 William St., New York.)
7 lbs. Sulphide of Soda.
3 lbs. Soda Ash.
75 lbs. Common Salt.

Enter yarn at a boil and dye just below the boil for one hour, keeping the material below the surface of the dye liquor as much as possible.

Tetrazo Sulphur Green 3 Y produces useful shades of green and possesses the desirable qualities of fastness characteristic of the sulphur colors.

Recipe No. 149.

Blue on Worsted Yarn.

Metamido Blue on 100 lbs. worsted yarn. Prepare the dye bath with

2 lbs. Metamido Blue.
(E. M. Thayer & Co., 411 Atlantic Ave., Boston.)
10 lbs. Glauber's Salt.
3 lbs. Sulphuric Acid.

Enter at 140° F. and dye at a boil for one hour.

Metamido Blue is fairly fast to light and is particularly useful for brightening alizarine colors.

Recipe No. 150.

Blue on Woolen Cloth.

Chrome Fast Blue 6 B A on 100 lbs. woolen cloth. Prepare the dye bath with

4 lbs. Chrome Fast Blue 6 B A.
(Berlin Aniline Works, 215 Water St., New York.)
10 lbs. Glauber's Salt.
3 to 4 lbs. Sulphuric Acid.

Enter at 140° F., bring to a boil and dye at this temperature for one hour. Raise the material, add

3 lbs. Potassium Bichromate,

and boil one hour longer.

Chrome Fast Blue 6 B A possesses excellent fastness to light and also has good fastness to steaming, ironing, rubbing, stoving, perspiration and carbonizing. The shades are somewhat reddened with ammonia. Its fastness to milling is fairly good. The direct dyeings of this color are brown.

Recipe No. 151.

Yellow on Cotton Yarn.

Tetrazo Yellow M G on 100 lbs. cotton yarn. Prepare the dye bath with

2 lbs. Tetrazo Yellow M G.
(American Dyewood Co., 156 William St., New York.)
2 lbs. Soap.
10 lbs. Phosphate of Soda,

and dye at a boil for one hour.

Tetrazo Yellow M G produces a desirable shade of greenish yellow, possessing good fastness to light.

Recipe No. 152.

Blue on Woolen Cloth.

Chrome Fast Blue 4 B A on 100 lbs. woolen cloth. Prepare the dye bath with

4 lbs. Chrome Fast Blue 4 B A.
(Berlin Aniline Works, 215 Water St., New York.)
10 lbs. Glauber's Salt.
3 to 4 lbs. Sulphuric Acid.

Enter at 140° F., bring to a boil and dye at this temperature for one hour. Raise the material, add

3 lbs. Potassium Bichromate,

and boil one hour longer.

Chrome Fast Blue 4 B A possesses excellent fastness to light and also has good fastness to steaming, ironing, rubbing, stoving, perspiration and carbonizing. The shades are somewhat reddened with ammonia. Its fastness to milling is fairly good. The direct dyeings of this color are brown.

Recipe No. 153.

Bluish Red on Woolen Cloth.

Azo Eosine 3 B on 100 lbs. woolen cloth. Prepare the dye bath with

3 lbs. Azo Eosine 3 B.
(C. Bischoff & Co., 88 Park Pl., New York.)
4 lbs. Sulphuric Acid.
15 lbs. Glauber's Salt.

Enter at 140° F., bring to a boil and dye at a boil until the color is exhausted from the dye bath.

Azo Eosine 3 B is an easily soluble and level dyeing color and will be found very useful in the dyeing of woolen piece goods.

Recipe No. 154.

Yellow on Cotton Yarn.

Thionol Yellow R on 100 lbs. cotton yarn. Prepare the dye bath with

6 lbs. Thionol Yellow R.
(Thomas Leyland & Co., 53 India St., Boston.)

12 lbs. Sodium Sulphide Crystals.
5 lbs. Soda Ash.
50 lbs. Common Salt.

Dissolve the dyestuff and sodium sulphide together and add to the bath containing the soda ash, then boil up and add the salt.

Enter the yarn at 180° F., bring the bath to a boil, dye for one hour just below the boil, and then squeeze and rinse thoroughly.

An after-treatment with potassium bichromate renders the dyeings a little faster without materially altering the shade. For a standing dye bath, the above amounts of dyestuff and sodium sulphide may be reduced one third.

Thionol Yellow R gives dyeings fast to light, acids, cross dyeing and washing.

Recipe No. 155.

Black on Cotton Yarn.

Colonial Black on 100 lbs. cotton yarn. Prepare the dye bath with

5 lbs. Colonial Black
(F. E. Atteaux & Co., 174 Purchase St., Boston.)
20 lbs. Common Salt.

Enter at 120° F., bring slowly to a boil and dye at a boiling temperature for one hour.

Colonial Black gives an excellent black, and will be found a useful color when a direct cotton black is desired.

Recipe No. 156.

Yellow on Bleached Cotton Yarn.

Diamine Fast Yellow 3 G on 100 lbs. bleached cotton yarn. Prepare the dye bath with

½ lb. Diamine Fast Yellow 3 G.
(Cassella Color Co., 182 Front St., New York.)
1 lb. Soap.
2 lbs. Sodium Phosphate.

Enter at 180° F. and dye at a boil for one hour.

Diamine Fast Yellow 3 G possesses excellent fastness to light and good resistance to acids. It is well suited to the dyeing of satin and union goods.

Recipe No. 157.

Black on Cotton Yarn.

Puretone Black on 100 lbs. cotton yarn. Prepare the dye bath with

5 lbs. Puretone Black.
(F. E. Atteaux & Co., 174 Purchase St., Boston.)
20 lbs. Common Salt.

Enter at 120° F., bring slowly to a boil and dye at a boiling temperature for one hour.

Puretone Black gives an excellent shade of black, and will be found to be a very useful color, when a direct cotton black is desired.

Recipe No. 158.

Drab on Cotton Yarn.

Paranol Drab on 100 lbs. cotton yarn. Prepare the dye bath with

½ lb. Paranol Drab.
(E. M. Thayer & Co., 411 Atlantic Ave., Boston.)
10 lbs. Common Salt.

Enter yarn at a boil and dye at a boil until the desired shade is obtained.

Paranol Drab dyes perfectly level and any shade of drab may be dyed perfectly even by using this product in combination with the other Paranol colors.

Recipe No. 159.

Yellow on Cotton Yarn.

Thionol Yellow G on 100 lbs. cotton yarn. Prepare the dye bath with

6 lbs. Thionol Yellow G.
(Thomas Leyland & Co., 53 India St., Boston.)
12 lbs. Sodium Sulphide Crystals.
5 lbs. Soda Ash.
50 lbs. Common Salt.

Dissolve the dyestuff and sodium sulphide together and add to the bath containing the soda ash, then boil up and add the salt.

Enter yarn at 180° F., bring bath to a boil, dye for one hour just below the boil, and then squeeze and rinse thoroughly.

An after-treatment with potassium bichromate renders the dyeings a little faster without materially altering the shade. For a standing dye bath use two-thirds the amounts of dyestuff and sodium sulphide mentioned above.

Thionol Yellow G gives dyeings fast to light, acids, cross dyeing and washing.

Recipe No. 160.

Blue on Cotton Yarn.

Thiogene Cyanine G on 100 lbs. cotton yarn. Prepare the dye bath with

10 lbs. Thiogene Cyanine G.
(H. A. Metz & Co., 122 Hudson St., New York.)
20 lbs. Sodium Sulphide.
10 lbs. Sodium Carbonate.

Enter the yarn at 190° F. and dye just below the boil for one hour. When the dyeing is completed, squeeze thoroughly and develop by steam and air, mixed, or in a hot room, then wash and dry.

Thiogene Cyanine G gives an excellent shade of blue, which possesses the characteristic fastness of the sulphur colors.

Mill News.

Those interested in receiving early and more complete investigated information of projected new mills, enlargements, improvements, fires, facts and gossip of the trade are referred to the Textile Advance News, issued weekly by the publishers of the Textile World Record, at $15.00 per year.

COTTON.

New Mills.

*Georgia, Griffin. At a meeting, held recently, of the stockholders of the Central Mills, J. J. Mangham was elected president; Douglas Boyd, vice-president, and J. W. Mangham, secretary and treasurer. Operations have begun, making three-yard sheetings and twills.

*Massachusetts, Adams. Work is being pushed rapidly on the new mill for the Renfrew Manufacturing Company, which is to take the place of the old Broadley Mill, and it is expected to start operations about November 1.

Massachusetts, Webster. Ground has been broken for the erection of a new cotton mill, 200 by 60 feet, for Capt. Amos Bartlett.

North Carolina, Charlotte. The Calvin Manufacturing Co. has been incorporated with capital stock of $300,000. T. G. Cox (Taunton, Mass.) and A. H. Washburn and E. A. Smith (Charlotte) are reported as interested. It is stated that they will take over the plant of the Orient Manufacturing Co. The present building will be enlarged and new machinery installed.

*North Carolina, Concord. J. L. Hartsell has been elected secretary and treasurer of the Young-Hartsell Mills, incorporated with capital stock of $75,000. Yarns will be manufactured at first and later looms will be installed.

*North Carolina, Stanley. The Carpenter Manufacturing Company will begin operations about October 1 on the manufacture of felts, batting, bagging and ties.

Pennsylvania, Philadelphia. Messrs. Fulton & Vandegrift have recently started up a plant at Church Street and Adams Avenue, Frankford, where they are operating 3 frames, beaming, plain and fancy warps. Mr. John Fulton, one of the partners, who superintends the plant, states that they are very busy.

*South Carolina, Gaffney. The Globe Manufacturing Company, incorporated with capital stock of $100,000, will erect a new building to be equipped with 4,000 spindles for manufacturing coarse ply yarns, Nos. 14 and 20. W. M. Webster will be active manager of the plant.

*Tennessee, Nashville. The Warioto Cotton Mills have been incorporated with capital stock of $200,000 to operate the plant formerly known as the Tennessee Manufacturing Company.

Enlargements and Improvements.

Chinnabee Cotton Mills, Talladega, Ala., have placed a repeat order for machinery with the Howard & Bullough American Machine Co., Pawtucket, R. I., consisting of pickers, cards, drawing frames, speeders and spinning frames.

*Alabama, Uniontown. The Ellawhite Cotton Mill has been closed during installation of new machinery. Company has recently increased capital stock to $100,000.

Connecticut, Norwich. The Totokett Manufacturing Company is making extensive improvements to the plant, including erection of a weave shed, 250 by 150 feet, one story and basement, with sawtooth roof. When completed all the looms from the old plant will be installed with additional new ones and the present mill will be used for various processes preparatory to weaving.

Georgia, Athens. It is reported that the Southern Manufacturing Co. proposes to double its capacity at an early date. At present it is operating 124 looms and 3,360 spindles.

*Georgia, Columbus. Contract has been let by the Swift Manufacturing Company for the erection of their new building, which will be equipped with machinery for weaving and spinning.

Georgia, Rome. The capacity of the Rome Duck Mills is to be increased. A new building will be erected and about 7,000 spindles and 145 looms installed.

*Illinois, Chicago. Contracts have been let for the new buildings to be erected by the Opaque Shade Cloth Company in West Pullman. Among the buildings to be built are two, 266 by 67 feet, four and five stories, and one, 113 by 70 feet, two stories.

Massachusetts, Adams. Alterations and additions are to be made to W. C. Plunkett & Sons' mill. An elevator towel will be built and the roller covering works, located in the beaming-room, removed to another building. The new dye house and engine room are nearly completed and the machinery will be moved in at once.

Massachusetts, Fall River. It is reported that the Seaside Mills, which contemplate greatly increasing plant, will consider either the Enfield Mill or Windsor Print Works properties, if their present location proves unavailable on account of water supply.

Massachusetts, Fall River. The Weetamoe Mills are to add two new boilers in the mill.

Massachusetts, Fisherville. The Fisher Mfg. Co. is building a large shed, 135 by 86 feet and will install 400 new looms in the addition when completed. Several of the looms now running in the mule room will be transferred to new shed.

Massachusetts, New Bedford. The City Manufacturing Company has awarded contract for erection of a new cotton shed, 140 by 100 feet, two stories, brick.

Massachusetts, Rockland. The Rockland Webbing Co., with an equipment of 24 looms, is oper-

ating the plant nights. Additional machinery is to be installed.

Massachusetts, Worcester. Contract has been awarded for an addition to the satinet mill of James C. Green, to be two stories, 30 by 64 feet, and to cost about $5,000.

New Hampshire, Nashua. Work has been started on enlarging one of the Jackson Manufacturing Co.'s mills. About 150 additional looms will be put in.

New York, Cohoes. A new water wheel is placed in Harmony Mill No. 1, and other extensive repairs are being made.

*New York, Lockport. The Niagara Textile Company, which is building an addition to their plant, will increase output of goods 60 per cent., making a total of 110 looms instead of 50.

North Carolina, Albemarle. Two large upright boilers, 250 h. p. each, are being installed in the Wiscasset Mills. Six thousand spindles are being installed in Mill No. 2, increasing capacity of card room.

North Carolina, Asheville. The Elk Mountain Cotton Mills are to increase the capital stock from $150,000 to $200,000, for purpose of building a bleachery.

*North Carolina, Brookford. The Brookford Mills, Inc., advise us that they are to install 3,000 additional spindles, 150 looms, four new cards and new intermediate and fine roving frames.

North Carolina, Charlotte. Sanders, Orr & Co. are to install a bleaching equipment in the plant. This concern makes batting, etc.

North Carolina, Concord. The Cabarrus Cotton Mills, operating 8,500 spindles and 542 looms, intend erecting a large addition.

*North Carolina, Gastonia. The new mill building of the Modena Mills, to be known as Mill No. 3, has been completed. About 8,000 new spindles will be installed at first.

North Carolina, Gastonia. Additional machinery is being installed in the Loray Mill and in a few weeks the entire plant will be running.

North Carolina, Gibsonville. Holt, Gant & Holt, of Elon College, have leased the Hiawatha Cotton Yarn Mill for a term of six years.

North Carolina, Lowell. The Lowell Cotton Mills are installing additional machinery in the plant, including 2,000 spindles and preparatory machinery.

North Carolina, Milledgeville. The Eldorado Cotton Mills have recently completed improvements to plant and installed new machinery.

North Carolina, Monroe. The Monroe Cotton Mills are reported as contemplating erection of an addition, 40 by 200 feet. New machinery will probably be installed.

*North Carolina, New London. We have been advised by the Tucker & Carter Rope Co. that they are not interested in erecting a new mill at present. They are, however, installing new boilers and boiler house, and adding about one-third to their machinery and power. (All contracted.) It is stated that when the new power company starts up they may erect a new mill, but that will not be for some two years.

North Carolina, Spray. It is reported that important improvements are to be made to the Nantucket Mills here, which will include the addition of 5,000 spindles, 50 looms and other necessary equipment, at a cost of about $100,000.

Ohio, Cincinnati. The new plant of the Railway Supply & Manufacturing Company, for manufacturing ring cotton batting and wadding, will soon be completed and in operation.

Pennsylvania, Chester. The new weave shed recently built by the Jordan Manfg. Co. has been filled with machinery and is now in operation. The company, previous to placing it in operation, gave a reception to about 500 prominent citizens of the city.

Pennsylvania, Philadelphia. The Delta Spinning Co., Frankford, is overrun with orders for their Combed Egyptian and Peeler yarns, which they are turning out on 6000 ring, 13,000 mule and 4000 twisting spindles. The company has recently put in new coning machines and two new Broadbent winders, and are also increasing their power plant by putting in a battery of five new 160 H. P. boilers. The superintendent is W. R. Garsed.

*Pennsylvania, Philadelphia. Work is well under way on the new buildings for the Lehigh Manufacturing Company, 22d Street and Lehigh Avenue.

Pennsylvania, Wilkesbarre. It is reported that the Wilkesbarre Lace Manufacturing Co. is contemplating enlarging its plant by a new addition to the bleach house.

Rhode Island, Crompton. An addition, 100 by 26 feet, is being built to the picker house of the Crompton Company's plant. They are also putting in a large tank (oil) for finishing purposes, and placed order for 800 (Coldwell & Gildard) warp stop motions.

Rhode Island, Pontiac. A new boiler is being installed in B. B. & R. Knight's mill.

Rhode Island, Manville. The Manville Co. is building a storehouse, 80 by 75 feet, brick, two stories. It will be connected by a bridge with the bleachery of the No. 4 mill.

Rhode Island, Pawtucket. Work is well under way on addition to the cotton department of the Lorraine Mfg. Co.'s plant. Machinery is being installed by the Howard & Bullough American Machine Co.

Rhode Island, Valley Falls. Contract has been awarded by the Frank Wood Mfg. Co. for the erection of a cotton weave shed, 194 by 90 feet, to be constructed of brick.

*South Carolina, Fountain Inn. At meeting held recently by the directors of the Fountain Inn Manufacturing Co., it was decided to increase the capital stock from $100,000 to $200,000. The new additions to the plant have been completed.

*South Carolina, Spartanburg. The Beaumont Manufacturing Co. will start work Oct. 1st on erection of their new mill. When completed they

will have a total of 19,680 ring spindles and 252 looms. Yarns from 6s to 8s will be made.

Tennessee, Fayetteville. It is reported that the Elk Cotton Mills are to erect a dam to develop power which will be converted into electricity and furnished to operate a new addition which the company contemplates erecting.

*Texas, Brenham. The Brenham Cotton Mills are installing the additional machinery in the plant.

Mills Starting Up.

Alabama, Alexander City. It is reported that arrangements have been made by C. E. Riley & Co., of Boston, Mass., whereby that company will start the Alexander City Mills. This plant was built several years ago, but owing to some disagreement among the owners, was never equipped. It has accommodations for 15,000 spindles for hosiery yarns.

*Georgia, Augusta. It is reported that preparations are being made for reopening the Warwick Mills, reported secured by G. H. Nixon.

Georgia, Raccoon. Operations have been resumed in the Raccoon Mills, after an idleness of several months.

Massachusetts, Great Barrington. The Riverdale Mills will resume operations on September first on full time.

*Massachusetts, Franklin. Operations have been started by the Franklin Mills Corporation, recently organized with capital of 10,000, to operate the Worcester Textile Mills.

New Hampshire, Dover. The Cocheco Woolen Mills have resumed operations after two weeks' shut down.

New Hampshire, Peterboro. The Phoenix Mill and Union Mfg. Co. have resumed operations after shut down of two weeks.

*New York, Victory Mills. The Saratoga Victory Mfg. Co. has resumed operations after shut down for needed repairs.

*Rhode Island, Coventry. Operations have been started in the new shoe lace factory established here by Earl Potter & Co.

*Texas, Denison. It is expected that the Denison Cotton Mill will be running to full time October 15.

Mills Shutting Down.

Utah, Provo. At meeting held recently by the Board of Directors of the Provo Woolen Mills, it was decided to close the mills as soon as stock on hand is utilized.

WOOLEN.

New Mills.

*Connecticut, Central Village. Joseph E. Fletcher is president and treasurer of the new company recently organized to operate the Plainfield Woolen Co.'s plant; Arthur Cox, vice president and Charles Bragg, secretary and agent. The capital stock is placed at $250,000. A number of new looms have been installed and others will follow.

Massachusetts, Lawrence. A new mill will be erected at this place by the American Woolen Company, which will operate same as the Wood Worsted Mills. The main building will be 1,000 feet long, divided by a thick partition wall from the next building, which will be 350 feet long. Both buildings will be six stories. Separate buildings will be erected for boiler and engine houses. Work has already begun on the foundations.

*Massachusetts, North Chelmsford. The Alsatian Combing Company are fitting up a plant in the building of the Moore Spinning Company for the combing and carding of fine wool. They expect to start with a force of twenty-five.

*New York, Amsterdam. The plans for the new rug mill of McCleary, Wallin & Crouse call for a five-story brick building, 80 by 303 feet. It is expected to be completed in about eight months.

*New York, Cohoes. The Star Woolen Company has been incorporated with capital stock of $100,000 to manufacture shoddies, etc. Ferdinand Aufsessor, M. F. Aufsessor are among the incorporators. This company will operate the Star Knitting Mill.

Pennsylvania, Philadelphia. David Graham & Co. are starting up a plant for the manufacture of fancy worsted suitings in the Dale Mill, Gillingham Street, Frankford. They will commence their operations with four broad looms using 2/20 cotton, twist and worsted. The goods will be sold direct.

Pennsylvania, Philadelphia. R. F. Shaen Sons & Co. is the name of a new concern which has applied for a charter for the manufacture of woolens and worsteds. This concern is a connection of the Crix Woolen Co., a recently incorporated concern, and the Burling Co., both located at Howard Street and Lehigh Avenue, where it will also be located. The incorporators are Harold F. Shaen, Robert F. Shaen and Edwin Booth.

Pennsylvania, Philadelphia. Thomas Hudson has recently started a small plant for the manufacture of ingrain carpets at 1727 Gillingham St., Frankford, where he has one loom now in operation and another to be installed within a few days. He is using 2-ply 16's cotton yarns.

*South Carolina, Columbia. The American Press Cloth Company has been incorporated with capital stock of $50,000, for purpose of manufacturing press cloth, as previously reported. John J. Seibels is president and treasurer of the company, Ben F. Taylor, vice president and James Taylor, Jr., secretary.

Enlargements and Improvements.

Canada, Ontario, Thessalon. As soon as the necessary machinery can be installed, the Thessalon Woolen Mill Co. will start manufacturing ready-made clothing.

Connecticut, Bridgeport. Plans have been prepared for the Read Carpet Company for a new brick building 112 by 57 feet, four stories. Work is nearing completion on a new dyehouse and storehouse.

Kentucky, Louisville. The Hope Worsted Mills,

which recently built an addition to the plant, are installing new worsted drawing machinery.

Maine, Camden. A new mule is to be installed in the Seabright Woven Felt Co.'s plant.

Maine, Dexter. A new engine, which will develop from 100 to 150 h. p., has been purchased by the Wassookeag Woolen Company and will be in running order in about two weeks.

*Maine, Foxcroft. Operations will start Sept. 10th in the new weave room of Mayo & Son, Inc. Fourteen new looms will be put in.

*Maine, Lisbon Centre. Work has been started on the erection of an addition, 162 by 62 feet, four stories, brick, for the Farnsworth Co. A new dye house and a two-story picker house is also under way. Will instal three new sets cards and other machinery.

Maine, Madison. The Madison Mills have recently installed four new spinning mules and will soon add ten new looms.

Maine, North Monmouth. A 35 H. P. gasoline engine has been installed in the Annabessacook Mills.

Maine, Oakland. The Oakland Woolen Co. is putting in six new looms.

Maine, Sanford. The Sanford Mills Co. is making necessary improvements in their dye house, including addition of about eight feet and a new roof.

Maine, Wilton. The Wilton Woolen Mill is having the dam at the lower woolen mill built five feet higher. This will allow the plant to be operated by either water or steam.

Massachusetts, Adams. The Blackinton Company is to install 25 new looms (ordered).

*Massachusetts, Cherry Valley. The new brick mill for the Chapel Mills Manufacturing Company has been completed.

*Massachusetts, Collinsville. The American Woolen Co. will rebuild the mill recently destroyed by fire. It is expected to have the plant ready for operations before winter.

Massachusetts, Dalton. A two-story addition is to be built to the Dalton Woolen Mill.

Massachusetts, Holyoke. Beebe-Webber Co. have placed order for 24 additional heavy worsted looms.

Massachusetts, Maynard. A new office building is being erected for the Assabet Mills. Several old mules are being replaced with new Davis & Furber ones.

*Massachusetts, Medway. Contract has been let and work started on foundation of new power house for the Medway Woolen Company. When completed the mill will be closed for purpose of installing new wheel flume and water wheel.

*Massachusetts, New Bedford. The Beacon Mfg. Co. has let contract for erection of the new addition, 400 by 150 feet, one story. This will be used for carding, spinning, weaving and finishing departments.

*Massachusetts, Uxbridge. It is expected to have the Hecla Mill, recently purchased by the American Woolen Company, ready to resume operations by November 1st. More than half the necessary machinery has been installed for manufacturing woolen yarns. E. M. Mansfield will be superintendent.

Massachusetts, Ware. The Gilbert Co. has installed 14 new looms in No. 1 mill (Gilbertville), and have removed 12 old ones to the mills at Ware.

*Massachusetts, Worcester. We have been advised by the Hopeville Mfg. Co. that although they have discontinued the Jamesville mill, they do not contemplate increasing the Hopeville plant at present.

Massachusetts, Worcester. Contract has been let for an addition, 64 by 30 feet, two stories, to James C. Green's mill.

New Hampshire, Claremont. Work has begun on new dam for A. Roberts & Co. They also propose putting in generators and using electric motors at the mills.

*New Hampshire, Guild. Fairbanks & Dorr have completed addition to their mill and have started running the entire plant nights. An additional set of cards, ten looms and a mule are being installed.

*New Hampshire, Newport. Machinery is being installed in the new woolen mill of Dexter Richards & Sons.

New York, Albany. Contract has been awarded by the Albany Felt Works, for erection of a brick addition, 80 by 50 feet, one story, to be used as a storehouse.

New York, Amsterdam. Shuttleworth Bros. have bought the mills of the Amsterdam Woolen Co. just east of their plant. The mill will be dismantled and new and modern machinery for the manufacture of rugs and carpets will be installed. Work on the building will be begun at once, but it is not expected to have it ready for operations before the first of the year.

New York, Waterloo. A new 700 h. p. twin engine is being installed in the Waterloo Woolen Company's plant.

New York, Watervliet. New machines are being installed in the Watervliet Mills.

North Carolina, Newbern. The greater part of Blades' Hosiery Mill has been destroyed by a fire which broke out in the dry house. Loss, $3,000.

Ohio, Cleveland. The Cleveland Worsted Mills are to instal additional looms in the plant.

Ohio, Ravenna. The Ravenna Worsted Company has increased the capital from $50,000 to $100,000.

Oregon, Union. A large wool scouring mill is to be established here in connection with the Union Woolen Mills and the Eugene (Ore.) Woolen Mills.

Oregon, Salem. The flax mill of Eugene Bosse has been entirely destroyed by fire, together with 100 tons of retted fibre and three stacks of flax straw. Loss $11,000.

*Pennsylvania, Landenberg. The Landenberg Worsted Mills, Ezra Lund, proprietor, are also building an addition, 75 by 35 feet, 3 stories, stone, and will install 1,200 spinning spindles, twisting and other machinery necessary, also new double bowl washing machine. A new 300 h. p. Tandem Compound Condensing engine will also be installed.

Pennsylvania, Philadelphia. The Shetland Worsted Mills, Ashmead and Wakefield Streets, Germantown, are very busy on men's wear and worsted and cotton dress goods. They state that they have enough orders on hand to keep them running full time until the end of February of the coming year. They are now operating 20 broad looms and expect to put in 6 new Crompton-Knowles, to be operated on the same class of goods, within a few weeks. The goods are sold through New York.

*Pennsylvania, Philadelphia. We learn that it is the Wilton & Brussels Carpet Co. which has leased part of the Hole Mill, and not the Thomas Develon's Sons. The former company manufactures Wilton rugs and body Brussels rugs.

Pennsylvania, Philadelphia. An addition is underway for the Bradford Mills, and it is expected that same will be completed next month. They propropose removing the warp dressing department to new building and instal 106 Knowles looms in space vacated.

Pennsylvania, Philadelphia. The Unity Woolen & Worsted Co., it is reported, will remove their establishment after November 1st to the Sidebotham Mills, Franklin and Church Streets, which will give them more room for their operations which have greatly increased since they first started up in this country a few years ago. They are operating 20 broad looms on plain and fancy woolens and worsteds, selling the goods direct. J. Clement is the manager and buyer.

Pennsylvania, Philadelphia. The Ellison Mills, now located at Franklin and Church Sts., Frankford, and which were recently purchased by the Germania Worsted Mills, after November 1st will be removed to Indiana Ave. and A St., where the Germania Mills, are operating their main plant consisting of 80 looms on dress goods. The equipment of the Ellison plant consists of 100 looms which will be put in operation again as soon as they are set up in their new quarters.

Pennsylvania, Tunkhannock. The Winola Worsted Yarn Co. contemplates erecting a new building.

Rhode Island, Centreville. The Kent Manufacturing Company, which has recently installed a new picker, will soon put in 12 new looms (ordered).

Rhode Island, Greenville. A new office building is under construction for the Greenville Woolen Co. They are also adding 25 new looms.

*Rhode Island, Providence. Work has been started on construction of the new dye house for the Atlantic Mills. The carding and combing departments of the plant are to be operated nights and subsequently other departments.

Rhode Island, Woonsocket. The Perseverance Worsted Co. has had electric lights installed in their plant.

Rhode Island, Woonsocket. Work is to start at once on erection of a large addition to the Lafayette Worsted Mill, for wool-washing plant and storehouse.

*Tennessee, Cleveland. The Cleveland Woolen Mills, which were partially destroyed by fire, expect to resume operations in full within a month. The machinery will be of the latest improved patterns.

Vermont, Burlington. The American Woolen Company has purchased the carbonizing plant under construction at this place and known as the Winooski River Shoddy Mills. It is expected that the plant will be in operation in a few weeks.

Washington, Kirkland. The Seattle Woolen Mill Co. has placed order for four (4) new looms, one press, a napper and one mule, also Apperly feed and Barker rub rolls for their cards. A new picker house has been built and new mixing picker and burr picker.

Mills Starting Up.

*Massachusetts, Charlton City. Nearly all the machinery has been installed in the Aldrich Manufacturing Co.'s new plant and operations will be started within a few days. About 40 people will be employed at the mill.

Massachusetts, Jefferson. The woolen mill of the Jefferson Mfg. Co. resumed operations this week after a shut down since August 5.

*Rhode Island, Hope Valley. Operations have been started by Young & Hammond, who purchased the Locustville Mill.

Mills Shutting Down.

*Massachusetts, Holyoke. The National Felting Co. is winding up its affairs and the machinery will be sold. The Beebe-Webber Co. will instal 20 new looms in the quarters vacated by the felting company.

Massachusetts, Monson. The Glen Mill, owned by Handel Beech, has been closed.

For Knitting Mill News. see Knitting Department.

SILK.

New Mills.

Connecticut, Putnam. Contract has been awarded for the erection of a two-story wood building, 150 by 44 feet, to be used as a silk mill by the Eureka Silk Company, who are to move here from Canton, Mass.

*Connecticut, Meriden. The New England Braid Company has been incorporated to continue plant started by L. Adlman.

New Jersey, Hoboken. The New Jersey Silk Mills have been incorporated with capital stock of $100,000. U. J. DePoli, West Hoboken; A. A. Kelley, Montclair, and H. H. Nieman, New York, are interested.

New Jersey, Paterson. James F. Yates, Henry Wilde and John T. Murn are reported incorporators of the Reliance Silk Co., with capital stock of $50,000.

New Jersey, Paterson. The Novelty Velvet Co. has been incorporated with capital stock of $50,000, for purpose of manufacturing silk and other textile fabrics. Eugene Rivollier, Paterson, and Eli Mirandon, Brooklyn, are interested.

New Jersey, Paterson. Harry Wilde, formerly with Doherty & Wadsworth, has started a plant in the Ward Street Mills, making broad silks.

New Jersey, Paterson. Wm. Roskop and Ralph Kirk, formerly with the Enterprise Silk Co., Reynoldsville, have leased a mill at this place where they will manufacture dress silks.

*New Jersey, West New York. The Hudson Silk Co., incorporated last March with a capital of $100,000, to manufacture silk and silk fabrics, has bought a three-story brick factory in this place for $16,000. This is a new building, 75 by 100 feet, and equipped with all the latest factory devices.

Pennsylvania, Easton. The new plant for the Northampton Silk Company has been put in operation. The building is 240 by 46 feet, two stories high, and equipped with 50 looms.

*Pennsylvania, Olyphant. Operations will be started early in December in the new silk mill here.

Pennsylvania, Reading. Charles Steiner, formerly of York, has purchased H. F. L. Rummel's property at this place and will remodel same for silk manufacturing. It is expected to have the machinery installed and ready for operations about Oct. 1st. Will start with 50 looms, which will be eventually increased to 200. Thomas Wright will be superintendent of the mill.

*Pennsylvania, Peckville. Work is under way on the new Bliss Silk Mill. The plant will be equipped with all the latest improved machinery.

*Pennsylvania, Plymouth. It is reported that the Bleckley Brothers, operating a plant at Freeland, are to establish a silk throwing plant at this place. The plans call for a building 140 by 350 feet.

*Washington, Bellingham. Operations have begun at the new mill of the Kulshan Silk Co., for the manufacture of plain black taffetas.

MISCELLANEOUS.

New Mills.

Connecticut, Shelton. Some much needed additional room in the plant of the S. Blumenthal Co. will be furnished by the erection of a two-story frame building to be used as a finishing and drying department. The contract has been let and work will be pushed as rapidly as possible.

Georgia, Athens. The Aberdeen Linen Mill has been put in operation to turn out high grade toweling. This company was organized several months ago and has A. H. Hodgson for president and W. T. Bryan for secretary and treasurer. The buildings are new and are equipped with machinery of the latest make.

Maine, Lewiston. A large plant for mercerizing cotton goods will soon be put in operation by the Lewiston Bleachery and Dye Works. When completed it is said it will be one of the finest and most complete plants in the country. The improvements now under way will increase the capacity of the works between 25 and 50 per cent.

*Massachusetts, Barrowsville. The new plant for the Barrowsville Bleachery Company will be started about October 15th. Frederick S. Hall (Taunton) is president of the company, Franklin H. Downs, treasurer and F. E. Burbank, manager.

*New Jersey, Wortendyke. Plans are being prepared for the Granite Linen Co. (370 Broadway, New York), for rebuilding the plant destroyed at this place by fire. A building 250 by 60 feet, 2 stories, with wings, 25 by 25 and 50 by 50 feet will be built.

Pennsylvania, Philadelphia. Mr. Irvine Carr, well known as a manufacturer in England, and until recently employed as superintendent of the Crix Woolen Co., has opened up a business for the burling and mending of woolen and worsted goods at 2632-36 Mascher St., under the name of the Kensington Burling Co.

Pennsylvania, Philadelphia. Thomas Smith, for some time employed by the John Mawson Hair Cloth Co., as finisher, has formed a partnership with H. Quicksall, who operates a waste factory in Frankford, under the name of Smith & Quicksall. They have started a plant at Dyre and Willow Streets for the finishing of cotton goods and make the finishing of haircloth a specialty.

*Pennsylvania, Philadelphia. The Stanley Mfg. Co., Adams and Church Streets, Frankford, state that they are now ready to cone yarns, having recently placed an order with the Foster Machine Co. for one of their 60 spindle cone winders, the machine to be delivered and set up within a week. This concern, which is very busy twisting, winding and spooling cotton, linen and worsted yarns, have been compelled at times to turn away orders, but now claim that their plant has been increased to such dimensions as to enable them to get out orders of any size.

Rhode Island, East Greenwich. Plans have been prepared for another large building to be erected for the Greenwich Bleachery. The new building will be 100 by 50 feet, and two and one-half stories high. It is expected to have same completed in two months.

Rhode Island, Woonsocket. A new plant for dyeing and bleaching yarn will be started in about three weeks in the old brush shop on Allen Street by Dr. J. E. Auge and Maximilian Job, who have formed a partnership.

Tennessee, Jackson. The Jackson Woolen Mills, manufacturing pants, overalls, etc., have been destroyed by fire. The loss is estimated at $100,000. partially covered by insurance.

Enlargements and Improvements.

*Connecticut, Jewett City. Contract has been let by the Jewett City Textile Novelty Co. for additional buildings for their new plant, recently completed. They will add a new one-story bleaching building, 40 by 60 feet; one gray room, 26 by 40 feet, one story and one can room building, 30 by 50 feet, two stories, all brick.

*Massachusetts, Lawrence. Construction work has begun on the new building for the Lawrence

Dye Works. This building will be 250 by 50 feet, three stories high.

Pennsylvania, Philadelphia. The Fairhill Bleachery, successors to Hulme Clements & Co., 2803-5-7 Fairhill St., is very busy on yarns, tapes, webbing and piece goods They have recently remodeled the plant, putting in a new 60 H P. Berry safety boiler, a 36-inch hydro extractor and new iron acid vats. The firm is now composed of Thomas Hulme, who superintends the establishment, and Edward A. Schneider.

Rhode Island, Pawtucket. John E. Bland & Co. are about to make an addition to their bleaching plant that will greatly increase their facilities for bleaching yarn on the cop.

Rhode Island, Pawtucket. The Harrison Yarn & Dyeing Company is to build an addition 100 by 50 feet, three stories, brick.

FIRES.

Kentucky, Louisville. The Mayfield Woolen Mills have been damaged by fire. The loss is placed at $1,100; covered by insurance.

Maine, North Vassalboro. Fire destroyed the shoddy mills operated by Edward Chase and Herbert Peace. The loss is estimated at $10,000 on each mill, with no insurance.

Maine, Turner. The Turner Woolen Mills, F. T. Faulkner, proprietor, have been destroyed by fire. The loss is placed at about $50,000, with insurance of $25,000. Mr. Turner lost his life in the fire.

New York, Staten Island, New Brighton. The Irving Manufacturing Co.'s plant has been destroyed by fire. The loss on building and machinery is placed at about $21,000 and on stock $9,000.

Pennsylvania, Philadelphia. On Monday, the 4th of September, a fire which started among a lot of finished goods in the basement of the three-story factory operated by the Jos. H. Masland Co., 4817 Main Street, Germantown, wrecked the plant and caused a loss of $20,000. The company states that the loss is partially covered by insurance and the factory will be repaired and put in operation again as soon as a satisfactory adjustment is made. They manufactured hammocks, etc., on 24 looms.

Pennsylvania, Philadelphia. The large building used by the Allen Dyeing Co., 2848 Frankford Avenue, was recently destroyed by fire, causing a loss of $15,000. The building, which was used by the company for dry and storehouse, containing over 20,000 pounds of dyed yarns. The fire is supposed to have originated through spontaneous combustion in a patent dryer. The damaged structure is to be repaired at once.

FACTS AND GOSSIP.

Canada, Montreal. The plant of the Oriental Company, which was partially destroyed by fire, has been removed to larger quarters, where facilities are much better.

Canada, Quebec, Sherbrooke. The Moore Carpet Co., Ltd., is incorporated with capital stock of $100,000 and is under an entirely new management. L. A. Bayley is president of the company and Henry A. Moore, managing director. John T. Fox is superintendent of the company. Brussels and Wilton carpets and rugs and worsted yarns are made. Plant is equipped with 2 sets woolen cards, 18 looms, one comb, 2 worsted cards. Goods are dyed and finished at the mill.

The Gonic Mfg. Co., Gonic, N. H., have put in a cloth opener and folder made by the Arlington Machine Works.

Georgia, Arnoldsville. G. H. Smith is interested in the subject of machinery for a steam laundry and also possibly for a knitting mill, and wishes to hear from manufacturers of laundry machinery, hosiery machinery, ribbers, loopers and hosiery presses.

Georgia, Atlanta. The Hartford National Bank (Hartford, Conn.) and Haas & McIntyre (Atlanta, Ga.) have entered suit against the Southern Blanket Mills asking that the company be adjudged bankrupt. B. H. Hill has been appointed receiver of the plant.

*Georgia, Augusta. The Murray Silk Mills will not start operations before September 15 or October 1. Delay is occasioned by inability to get the machinery in position as soon as expected.

Georgia, Hagan. It is reported that a company capitalized at $200,000 is to erect a cotton mill between this place and Claxton. R. A. Scott is mentioned as interested.

*Georgia, Montezuma. We learn that the report concerning increase to be made in the Montezuma Manufacturing Co.'s plant is not authentic.

Messrs. Waterhouse & Buffum have put in their new mill at North Adams, a cloth opener and folder made by the Arlington Machine Works.

Georgia, Washington. T. M. Fitzpatrick & Bro. are reported as having purchased site for a cotton mill which they propose operating with an organized company.

Maine, Clinton. It is reported that Frank L. Besse is interested in project under way for establishing a four-set woolen mill here.

*Maine, Turner. It is reported that parties have in contemplation rebuilding of the Turner Woolen Mills on the old site, as soon as the estate is settled.

Maryland, Franklinville. The old cotton duck plant at this place is being dismantled and the machinery transferred to other mills.

*Massachusetts, Adams. The Adams Woolen Company has been incorporated with capital stock of $50,000 to operate the Graham & Clark Mill. William P. Martin, William B. Orr and James C. Chalmers are interested.

The Goodall Worsted Co. of Sanford, Me., have put in a cloth opener and folder made by the Arlington Machine Works.

Massachusetts, Chicopee. The Taylor-Bramley Manufacturing Company has discontinued manufacturing jerseys, sweaters and other athletic goods and will hereafter manufacture underwear on a much larger scale.

Massachusetts, Dedham. The Norfolk Yarn Co. has been incorporated with capital stock of $15,000. Edwin W. Reath is president of the company and Charles A. Turner, treasurer.

*Massachusetts, Franklin. William J. Eddy is president of the Franklin Mills, a reorganization

of the Worcester Textile Company, and D. B. Starr, treasurer. Benj. Laycock will continue as superintendent of the plant. It is expected to have the mill in running order within two weeks.

The Marston Worsted Mills of Skowhegan, Me., have put in a cloth opener and folder made by the Arlington Machine Works.

*Massachusetts, North Adams. The auction sale of the Windsor Company's property to J. & S. Ferguson has been confirmed by J. J. Townsend, referee in bankruptcy. Definite plans for the mill have not yet been prepared, but it is stated that C. M. Howard will be at the head of the new company.

*Massachusetts, North Brookfield. The Indian Orchard Flax Co. is now fully established here.

*Massachusetts, Westfield. The Planet Company was incorporated last week to manufacture and deal in threads, yarns, etc. Albert M. Schappa is president, Charles A. Hickson, treasurer. Mr. Schappa was president of the Planet Mfg. Co., which was sold under foreclosure last May.

The Concord Mills of Concord Junction, Mass., have put in an Arlington cloth opener and folder.

Massachusetts, Westboro. Joseph S. Mason, superintendent of the Westboro Weaving Co., has resigned his position and leased the ground floor of a building on East Main St., where he will manufacture narrow fabrics, tapes, etc.

*Massachusetts, Westboro. The Westboro Carpet Company's plant, now in charge of Emery B. Gibbs, receiver, will be operated until present stock on hand is utilized. It is stated that a new company will be formed to continue the business and that Wm. J. Hogg is interested.

Mexico, Chihuahua, Santa Rosalie. It is reported that Ketelsen & Degetau, owners of the cotton mills at this place, recently destroyed by fire, have made arrangements to erect a new mill in the suburbs of Chihuahua.

*Mississippi, Meridian. Owing to failure of Eastern capitalists to subscribe $200,000 worth of stock, the local capitalists have assumed charge and half the capital has already been secured. The plant will be bonded for the balance.

The Kent Mfg. Co. of Centreville, R. I., have recently added an Arlington sewing machine made by the Arlington Machine Works.

*Missouri, Kansas City. The Kansas City Cotton Mills Co. has been incorporated with capital stock of $1,000,000 to establish a cotton mill of 20,000 spindles and a woolen mill of four sets. It is stated that land and buildings have been purchased and will be remodeled. William Peet is president of the company; Witten McDonald, vice president, and Edward E Holmes, secretary and treasurer.

New Jersey, Paterson. The New Jersey Shawl Co., capitalized at $20,000, has been incorporated to manufacture textile fabrics, etc. The directors are Edward Moeller and Ludwig Littauer of New York and David Cohn of Paterson.

New York, Clayville. The sale of the Empire Woolen Mills has been postponed until Oct. 16th.

S. Slater & Sons, Inc., Webster, Mass., have put in an Arlington sewing machine, made by the Arlington Machine Works.

New York, Rochester. It is reported that the Narrow Fabric Manufacturing Company, of Toronto, Canada, is considering starting a branch mill in the United States and has this place under consideration. This company manufactures bias and seam bindings.

New York, Staten Island, New Brighton. The Irving Manufacturing Co. will start rebuilding their plant as soon as the insurance is adjusted. They will put in 12 80-inch looms.

*New York, Waterloo. Work is being pushed on the new mill for the Waterloo Woolen Manufacturing Company, but it is not likely they will be able to start operations before the first of November.

The U. S. Finishing Co. have equipped their Passaic branch with the Arlington cloth openers and have added to their Norwich branch another of these machines, made by the Arlington Machine Works.

North Carolina, Fayetteville. The Flora Cotton Mill Co. has been incorporated with capital stock of $400,000 by H. W. Lilly, W. D. McNeill and J. K. S. Ray, the latter of Asheville.

*North Carolina, Roaring River. The Damask Manufacturing Co. is reported in financial difficulties and involuntary proceedings in bankruptcy have been started against the concern. F. H. Chamberlain has been appointed temporary receiver.

North Carolina, Spray. It is reported that project is under way for organizing the American Thread Company for purpose of manufacturing fine cotton and woolen yarns. B. Frank Mebane is mentioned as interested.

The Arlington Machine Works have recently shipped four of their large bleaching kiers to a Southern mill.

*Oregon, North Bend. It is reported that the North Bend Woolen Mill, sold at receiver's sale some time ago, is to be started up soon by A. W. R. Berr, representing Eastern capitalists.

Oregon, Oregon City. It is reported that a general strike is on at the woolen mill of the Oregon City Manufacturing Company, caused by the installation of the double loom system. This is a 14 set mill with 60 looms on cassimeres, blankets, shawls, flannels and carriage robes.

Oregon, Pendleton. It is reported that the Pendleton Woolen Mills are in financial difficulties and action is being taken by H. C. Judd & Root (Hartford, Conn.) to have company petitioned into bankruptcy. The mills are being operated by Charles J. Ferguson, who holds a two years' lease.

*Oregon, Portland. It is reported that preliminary arrangements have been completed for the establishment of a wool scouring plant at this place by Thomas Ross, of Las Vegas, N. M. Plant will be located on site formerly occupied by the Portland Woolen Mills.

The Arlington Machine Works are putting in a complete electric lighting equipment, and are considering the matter of equipping their works with electric motors and dispensing with steam.

*Pennsylvania, Chester. It is reported that the Philadelphia parties reported having purchased the plant of the Standard Spinning Co. will soon start it up.

Pennsylvania, Chester. The Chester Manufacturing Company's plant has been purchased by George W. Elkins, of Philadelphia, for $75,000. It is understood that many additions and improvements will be made to the plant.

Pennsylvania, Darby. It is reported that the worsted machinery at the Crum Lynne factory, will be purchased by Geo. Grayson and removed to his mill at this place.

*Pennsylvania, Kutztown. The York Silk Co.'s branch mill, at this place, is running with equipment of 38 broad looms and 10 narrow looms. They contemplate installing 76 more (Thayer) looms within a short time.

The Namquit Worsted Mills, Bristol, R. I., are adding to their weaving department, and have placed an order with the Crompton-Thayer Loom Co. for a number of high speed worsted looms.

Pennsylvania, Millville. The Enterprise Worsted Mill was badly damaged in the recent electrical storm. The roof was torn off and building otherwise damaged.

Pennsylvania, Philadelphia. S. John Lea has purchased the Industrial Dyeing & Finishing Works and will continue operating same.

Pennsylvania, Philadelphia. The Rockhill Mfg. Co. has been organized with capital stock of $20,000 to manufacture waste, yarns and shoddies. Richard Hall is president of the company, James D. Brooks treasurer and Ross B. Linton secretary. The plant is located in the Rockhill Mill, West Manayunk.

*Pennsylvania, Philadelphia. The Aberfoyle Manufacturing Co. will soon have its new plant in operation.

Pennsylvania, Philadelphia. An application has been made by the Courtrai Mfg. Co. for a charter, the incorporators being Hughes Fawcett, Benjamin T. Fawcett and Keith K. Skene. The company, which has been very successful twisting lines, cotton yarns, flax or linen yarns and coning yarns, has been increasing their plant from time to time and now occupies almost the entire building at 4155 Frankford Avenue.

Pennsylvania, Philadelphia. The receiver for the assigned plant of William L. Wright, manufacturers of wool substitutes and garnetted worsted wastes at Ruffner Street and Germantown Avenue, has decided to sell the plant, which has been shut down for some time, at public auction; the sale to take place some time during the month of September. The equipment of the establishment consists of 5 cards, 2 pickers, 1 willow and 1 duster.

The Hope Worsted Mills of Oakland, R. I., have placed an order for ten heavy worsted looms, thirty harness capacity, with the Crompton-Thayer Loom Co., Worcester.

Pennsylvania, Philadelphia. An application has been made for a charter for the F. W. Maurer & Sons Company by Jos. W. Maurer, Wm. H. Maurer, A. C. Maurer, F. H. Maurer, John K. Loughlin and William J. Maurer. The concern is now located at 528 Cherry Street, where it is operating 50 looms on window shade trimmings, etc., under the name of F. W. Maurer & Sons.

Pennsylvania, Philadelphia. Mr. John M. Schwehm, senior partner of the firm of John M. Schwehm & Sons, announces that he has withdrawn from the firm. The business will be conducted in the future under the name of John M. Schwehm's Sons. The plant, which is located at 13 and 25 Wister Street, Germantown, contains 350 looms, which are run on hair cloths, press cloths, silk linings and upholstery goods and is one of the oldest in that section of the city.

The LaPorte Woolen Mills, LaPorte, Ind., have ordered six heavy worsted looms of the Crompton-Thayer approved type.

Rhode Island, Providence. The building of the Aldrich Manufacturing Co. was badly wrecked by the bursting of a flywheel about 20 feet in diameter. None of the employes were injured.

Rhode Island, Greenville. It is reported that the Fountain Spring Mill has been leased by Harry Kemp, who will start a shoddy plant.

Rhode Island, Oakland. The Coronet Worsted Company, which has been operating the carding and spinning departments with day and night force, has begun running the weave room on similar time.

Rhode Island, Woonsocket. The Perseverance Worsted Mills Co. has sold the mill property to James F. and Ernest Singleton, who will operate same as co-partners.

South Carolina, Cheraw. It is reported that Charles Iseman, formerly superintendent of the Marlboro Cotton Mills at McColl, is interested in a proposition to establish a cotton mill here.

South Carolina, Columbia. At a recent meeting of the Olympia Cotton Mills the company was reorganized and it was voted to increase the capital stock to $3,000,000.

South Carolina, Gaffney. W. M. Webster has resigned as secretary of the Gaffney Mfg. Co., and it is reported he is to organize another important textile enterprise at Gaffney.

The Massasoit Mills, Huntington, Mass., have placed an order for 45 new looms for their new mill with the Crompton-Thayer Loom Co., Worcester, Mass.

*South Carolina, Walterboro. The Colleton Cotton Mills have been purchased by John F. Lucas for $53,050. It is not yet known whether Mr. Lucas will operate the plant or dispose of it to other parties.

*Tennessee, Jackson. The Jackson Woolen Mills will start operations in temporary quarters in a week or ten days. In the meanwhile their plant will be rebuilt and equipped with 100 sewing machines, for making pants, overalls, shirts and children's suits.

Tennessee, Lawrenceburg. It is reported that W. S. Dustin is considering purchase of equipment for a 10,000 spindle mill.

Tennessee, Springfield. The Springfield Woolen Mills are obliged to run day and night to keep up with their orders.

Virginia, Harrisonburg. A committee comprising H. W. Bertram, H. B. Miller and Owen B. Brock has been appointed to solicit subscriptions to the capital stock necessary for securing the removal of the Horrah & Hellar Silk Mill (So. Bethlehem, Pa.) to this place.

Personals.

Cotton.

Henri Tessier, overseer of the carding room at the Merchants Mfg. Co., Fall River, Mass., has resigned to accept a similar position with the Warren Mfg. Co., Warren, R. I. He will be succeeded by Paul A. Smithson of Victory Falls.

O. H. Farr has resigned as superintendent of the Witham Cotton Mills, to accept a similar position with the Monroe Cotton Mills, succeeding J. W. Mears, now superintendent of the Union Cotton Mills, at Lafayette.

Oliver H. Moulton, for more than 41 years superintendent of the Hamilton Mfg. Co., Lowell, Mass., has resigned. Mr. Moulton is at present abroad, where he has been traveling for the past six months in the pursuit of rest and health. Clarence N. Childs, formerly assistant to Mr. Moulton, will at once succeed him in the superintendency of the mills.

Robert Topping, who for the past six months has been finishing for the dyeing, printing and finishing works of the Trimble Co., Philadelphia, Pa., has returned to his old position in charge of the finishing at the Waldrich Bleachery, Delawanna, N. J., which place he had occupied for eight years previous to going to Philadelphia.

J. H. Ledgard, superintendent of the Meridian (Miss.) Cotton Mills, has resigned to become general manager of the Tupelo (Miss.) Cotton Mills.

James H. McNaughton has resigned as overseer of weaving at the mill of the Pierce Mfg. Corporation, New Bedford, Mass.

Walter B. Hall of Pontiac, R. I., is the assistant superintendent of the Hamilton Mfg. Co., Lowell, Mass.

Joseph Gamwell is the new superintendent of the Darlington (S. C.) Manufacturing Co.

T. M. Crowell has been made superintendent of the Oxford Cotton Mills, Oxford, N. C.

Charles H. Eames, who is secretary of the Lowell (Mass.) Textile School, will also perform the duties of principal.

Mr. William P. Wright, for several years foreman of the dyeing establishment for the U. S. Finishing Co. of the Pawtucket, R. I., branch has resigned to accept a position at Sterling, Conn.

A. B. Brannon, assistant superintendent of the Anderson (S. C.) Cotton Mills, has changed to the Buffalo Cotton Mills at Union, S. C. J. E. Shaw is his successor.

Edward F. Dorsey has succeeded Arthur Crowther as overseer of the cloth room of the Corr Mfg. Co., Taunton, Mass.

Oliver Moulton, for forty-five years superintendent of the Hamilton Mills, Lowell, Mass., has resigned, and will be succeeded by Charles M. Childs.

Charles O. Walker, for 23 years paymaster for the Warren Cotton Mills and Thorndike Co., in West Warren, Mass., has tendered his resignation.

Edward E. Bartlett, superintendent for the Sibley Mfg. Co., Augusta, Ga., has resigned his position and been succeeded by James Platt, formerly superintendent of this mill.

Peter E. Victory, overseer of weaving for the Manville Co., Manville, R. I., has resigned and accepted a position as overseer of weaving in a mill at Fall River, Mass.

Frank Porter, formerly of Taunton, Mass., has accepted the position as superintendent with the Danielson Cotton Mills Co., Danielson, Conn., Mr. Sanborn, the former superintendent, having resigned.

J. P. McCraw, secondhand in the weave room of the Richland Mill, Columbia, S. C., has resigned and taken a position as overseer of weaving in the Enterprise Mill at Kings Mountain, N. C.

Cabot Devoll has secured the position of overseer of dyeing for the United States Finishing Company at Pawtucket, R. I.

R. D. Jones has resigned as superintendent of the Anchor Cotton Mills, Huntersville, N. C., to accept a similar position with a mill at Salisbury, N. C. He was four years at the Anchor Mills.

George Astil has been promoted to the position of manager of the Glendale Elastic Fabric Co., Easthampton, Mass., to fill the vacancy caused by the death of J. W. Green.

P. W. Prim has accepted the superintendency of the Huntsville (N. C.) Cotton Mills. He was formerly overseer of weaving at the Gibson Mill, Concord, N. C.

William K. Sawyer has resigned his position as designer for the West Boylston Mfg. Co., Easthampton, Mass., to accept a position with the Hewitt Rubber Co. of Buffalo, N. Y.

James C. Platt has been appointed superintendent of the Sibley Mfg. Co., Augusta, Ga. Mr. Platt resigned the place he now has about four years ago and went to merchandising. He had been superintendent about twenty years. He succeeds E. E. Bartlett.

James H. Cobb, boss weaver at the Belton (S. C.) Cotton Mills, succeeds W. C. Cobb as superintendent.

W. A. Brooks, formerly of Lancaster, S. C., is now overseer of carding and spinning at the Chinnabee Cotton Mills, Talladega, Ala

W. A. Wheat has resigned as overseer of spinning at the Orr Cotton Mills, Greenville, S. C., where he has been for the past five years. J. A. Norris succeeds him.

W. E. Alexander has resigned as overseer of weaving at the Walhalla (S. C.) Cotton Mills.

Adelbert M. Nichols, superintendent of the weaving department of the Monadnock Mills, Claremont, N. H., where he has been employed for 30 years, has resigned on account of ill health. He will be succeeded on Oct. 1st by Herman Gerber of Providence, R. I.

Howard R. Whitehead, assistant overseer of carding at the Ann & Hope Mill, has been promoted to be overseer of carding of the No. 4 mill of the Lonsdale (R. I.) Company, succeeding George Bills, resigned.

Ernest Matchmaker, overseer of weaving at the Atlantic Cotton Mills, Lawrence, Mass., has resigned.

Robert Foster has resigned as overseer of the combing, carding and washing departments of the top plant of the Arlington Mills, Lawrence, Mass., to engage in manufacturing with the owners of the Westmoreland Dye Works, Philadelphia.

Woolen.

Charles Haynes has become overseer of finishing in the woolen mills of S. F. Cushman & Sons, Monson, Mass.

George Seagraves, Clinton, Mich., formerly assistant superintendent under Mr. John Wilson, has resigned to accept a position as superintendent of the Reedsburg (Wis.) Woolen Mill.

W. Henry Bailey of Woonsocket, superintendent of the Stanley Woolen Co.'s mill in Calumet Village, Uxbridge, Mass., severed his connection with that company recently.

Edwin Johnston, who recently resigned his position as boss dyer in the Graham & Clark Woolen Mill at Maple Grove, has accepted a position with the Merchants Woolen Co., Dedham, Mass.

Walter Devoe has retired from the superintendency of Mill No. 2 of the Mann & Stevens Woolen Co., East Brookfield, Mass.

George Morrissey has taken a position in the weaving department at the Pontoosuc Mill.

Hugh O'Donnell has completed his duties at the Taconic Mill, Pittsfield, Mass., and accepted one at Tillotson's.

Charles Broadhurst of England has taken the position of designer in worsteds at the Saranac Mill, Blackstone, Mass.

William Hinchliffe, superintendent of the Passaic Woolen Mills, Passaic, N. J., has resigned and has been succeeded by Thomas L. Cowan.

James Chisholm has been engaged as designer for the Adams Woolen Co., Adams, Mass., recently incorporated.

James Simpson, formerly with Howland Croft Sons & Co., has engaged as manager for John H. Dearnley, Philadelphia, succeeding Fred Carter. The latter goes with James Lees & Co., Bridgeport, Pa.

Thomas J. West has resigned as general manager of the Norwalk Mills Company, Winnipauk, Conn., to engage in business with his sons at West Conshohocken, Pa.

Thomas Robertshaw has resigned as overseer of wet finishing at the Brightwood Mfg. Co., North Andover, Mass., and James E. Gillespie has advanced to the position as overseer.

John Malley, loom fixer at the Glen Worsted Mill, Harrisville, R. I., recently completed his duties for that concern. That he was a popular young man was demonstrated on the evening of his leaving, when the weavers gathered about him and presented Mr. Malley with a handsome Morris rocking chair for Mrs. Malley.

George L. Harrington has completed his labors in the designing department of the Cocheco Mfg. Co., E. Rochester, N. H.

Frank Pearson tendered his resignation as superintendent of the Hope Worsted Mills Co., Louisville, Ky., to take effect September 30th, when he sails for England from Philadelphia.

George Schofield, who has been agent for the Beoli Mill of the American Woolen Co., Fitchburg, Mass., has finished his duties there and gone to Moosup, Conn., where he will take the position of agent of the mill there owned by the same company. His place at the Beoli Mill will be filled for the present by Edmond Corcoran, who is agent of the company's mill at South Fitchburg. Mr. Corcoran will have charge of the two mills.

Robert F. Whitehouse has been appointed general manager by the Chambersburg Woolen Co., of Chambersburg, Pa.

D. P. Scribner, superintendent of the Yantic (Conn.) Woolen Company, has resigned, and will retire from the woolen business.

George Seagrave is the superintendent of the plant of the Appleton Woolen Mills at Reedsburg, Wis., succeeding F. S. Klebart, who has gone to Columbiaville, Mich., to become superintendent of the Columbiaville Woolen Mills.

J. R. Hinchcliffe, the retiring agent of the American Woolen Co.'s mill, Moosup, Conn., was given a grand send-off by the employes of the mill and his friends The gathering was held in a hall, and during the evening Mr. Hinchcliffe was presented with a silver loving cup, suitably inscribed, and to Mrs. Hinchcliffe was given a basket of cut flowers.

E. Morrow, formerly of Peterboro, N. H., has accepted the position as boss carder nights for the Granite State Mills, Guild, N. H.

Thomas Johnson, formerly with F. S. Mackenzie, Bridgewater, Vt., has accepted the position as boss weaver for the Somerset Woolen Co., Monson, Mass.

Harry M. Mann, formerly of the Lorraine Mills, Pawtucket, R. I., has accepted the position as overseer of spooling, warping, winding and dressing for the Laurel Mfg Co., of Somerville, N. J.

Frank O. Besser, for several years overseer of weaving for the Kent Mfg. Co., Centreville R. I,, has resigned and taken a similar position in a woolen mill at Uxbridge, Mass.

Irwin Ferguson has resigned as overseer of spinning at the Mayo Woolen Mills, Millbury, Mass., to accept a similar position at Charlton City, Mass.

G. W. Field, superintendent of the Warren Woolen Co. of Warren, Mass., has resigned. He has been superintendent for this company for the past six years. Thos. Cochran of the Weybosset Woolen Co., Providence, R. I., takes Mr. Field's place at the Warren Woolen Co.

E. S. Creamer, for the past two and a half years designer and manager for the Yorkshire Worsted Mills, Lenni, Pa., has resigned, to take effect October 1, to accept a position as designer and manager of the two large mills of Murphy Bros. & Co., at Chester, Pa.

W. A. Tucker has accepted a position as superintendent with the Central Woolen Company, Stafford Springs, Conn.

Miles Collins has been appointed superintendent of the Abbott Worsted Co.'s mill at Forge Village, Mass. He succeeds Frank Hindle, who filled the position twenty-five years, and has now retired.

Clarence Sherman has been promoted to loom fixer at the Taylor Mfg. Co., Hope Valley, R. I.

Deaths.

Horace P. Simpson, superintendent of the Jefferson Mill of the Amoskeag Mfg. Co., Manchester, N. H., died at his home in that city, recently, aged 77 years.

Samuel Pyne, president of the Agawam (Mass.) Company, makers of flannels and dress goods, died on August 12th, aged 81 years.

Thomas Hanford, aged 82 years, died in Utica, N. Y., recently. He came from England and located in Philadelphia in 1852. Later he moved to Utica and started a small knitting mill. He introduced the knitting of Scotch caps and designed machinery for this class of work. He established the Hanford Scotch Cap Company, and upon his retirement in 1884 the name was changed to the Mohawk Valley Cap Company.

Joseph W. Green, aged 57 years, treasurer and general manager of the Glendale Elastic Company, of Easthampton, Mass., died at his home Aug. 29th.

David Mowry Lee of South Uxbridge, Mass., aged 62 years, died at his home Aug. 30th. Mr. Lee was born in Seekonk, R. I., and came to Uxbridge when a young man. He was well known as a mill man in this section, where he had been identified with many manufacturing interests for the past 30 years.

John A. Wiley, president of the Davis & Furber Machine Co., and one of the most prominent and highly respected citizens of North Andover, Mass., died at his residence September 1, at the advanced age of 80 years. The deceased was born in South Reading. In 1845 he secured a position with Gleason & Dow, the predecessors of the Davis & Furber Machine Co. When this latter concern was incorporated in 1883, he was chosen president, and held this position until the death of Hon. George Davis, in 1891. Then he was elected treasurer of the company, and after four years' service he resigned and was again chosen president, and held that office at the time of his death. Mr. Wiley's conspicuous characteristics were sincerity and simplicity. He will be sadly missed in that vicinity. He is survived by a widow.

Francis T. Faulkner, a prominent woolen manufacturer of Turner, Me., was burned to death in his mill at Turner, which was destroyed by fire on the morning of September 3d. Mr. Faulkner was born in Boston, in 1834. He was one of the best known citizens of Androscoggin county, a man of liberal views, charitable and of social disposition.

W. Stuart Walcott, president of the New York Mills, New York Mills, N. Y., manufacturers of cotton goods, died Monday night, September 4. He was chairman of the board of visitors of the State Hospital, and a prominent and highly esteemed citizen of this section.

T. S. Barraclough, wool buyer for the Pacific Mills, Lawrence, Mass., died September 26th, aged 47 years, seven months. He was born in Lawrence and obtained his education there. After graduating from the high school he started to work in the wool shop of this mill to learn wool sorting under his father, who was overseer of that department for more than 20 years. Later he opened a branch office for Coffin & Dodd in St. Louis, Mo., where he remained for five or six years. Returning East he entered the employ of J. Koshland & Sons, one of the largest wool houses in the United States, as wool buyer. He remained with them for 12 years and last April accepted the position he held at the time of his death. The cause of his death was the result of an accident while making one of his trips across the ocean, which occurred four years ago, when he fractured his collarbone. He was a man of many excellent characteristics, and his death is mourned by a large circle of friends and acquaintances.

Charles Bloomfield, a member of the Waiontha Knitting Mills, Richfield Springs, N. Y., died September 10th, at his home in that place. He is survived by two sons, one of whom is Allen F. Bloomfield, secretary of the Waiontha Co.

George A. Hurd, an esteemed citizen of Dover, N. H., died September 25th at his home in that city. Prior to his last illness he was superintendent of the mills of the Cocheco Mfg. Co.

James B. M. Grosvenor of New York, president of the Grosvenor-Dale Company, was stricken on a Third Avenue elevated train September 25th and died in a few minutes after he had been carried to the station. Mr. Grosvenor was born in Providence, R. I., Feb. 12, 1840. Among other business positions he was president of the Fireproofing Company, a director of the Driggs-Seabury Gun & Ammunition Company, the United States Casualty Co., a trustee of the Greenwich Savings Bank, and a member of many clubs. Having amassed a large fortune as a commission merchant in white goods, Mr. Grosvenor retired about fourteen years ago.

John Spencer Turner, director and vice president of the United States Cotton Duck Corporation and head of the J. Spencer Turner Company of New York, died of apoplexy recently at Caldwell, N. J. Mr. Turner was 75 years old, and one of the best known men in the cotton duck trade. He was instrumental in organizing the so-called cotton duck trust.

John Howard Nichols of Newton, Mass., died Sept. 16th. He was nearly 68 years old, and leaves a wife and two daughters. He was treasurer of the Dwight Mfg. Co., and from 1886 to 1900 was also treasurer of the Great Falls Mfg. Co. He held extensive interests in many of the cotton mills in the Southern States.

New Publications.

[Any work noticed under this head can be obtained through the office of this journal.]

Woolen and Worsted Finishing; Part III.; John F. Tinmerman; American School of Correspondence, Chicago, Ill.

The third part of the instruction papers on woolen and worsted finishing is equal to the first two which we have already reviewed. It treats of the finish of various fabrics, including the following: Cassimeres, Saxony finish, velvour finish, union cassimeres, cheviots, kerseys, meltons, beavers, chinchillas, outing flannels, fine doeskins and face goods, double cloths and reversibles, low grade goods, thibets, satinets, blankets, worsteds, plain and fancy; serges, dress goods, poplins, worsted cheviots. Part III. closes with chapters on bleaching woolen goods, cutting flocks and facts worth remembering.

The Synthetic Dyestuffs and Intermediate Products; by John Cannell Cain and Jocelyn Field Thorpe; 391 pages, 6 by 9; J. B. Lippincott Company, Philadelphia. Price $5.00.

Without making any pretensions to compiling an exhaustive treatise on the subject, the authors of this work have endeavored to place before the reader as much information as could be condensed into a book of this size. It is a book for the student rather than the practical dyer. The following is an abstract of the table of contents: Part I—Theoretical: coal tar, its occurrence and purification; nitration; sulphonation; amido-compounds; hydroxyl compounds; carboxyl compounds and aldehydes; application of the dyestuffs; classification of the dyestuffs; the nitroso-dyestuffs; the nitro-dyestuffs; the azo dyestuffs; hydrazone dyestuffs; auramine; triphenylmethane dyestuffs; pyronine dyestuffs; acridine dyestuffs; oxyketone dyestuffs; diphenylanime dyestuffs; quinoxaline dyestuffs; thiazol dyestuffs; quinoline dyestuffs; indigo; the sulphur or sulphide colors; xanthone dyestuffs; a short history of the synthetic coloring matters. Part II—the technical laboratory; preparation of intermediate products; preparation of dyestuffs, etc. Part III—intermediate products; the application of the coloring matters; the valuation of a coloring matter; the quantitative and qualitative analysis of dyestuffs; investigation of dyestuffs on the fibre.

Handbook of Special Industries (Handbuch der Spezialitaeten-Industrie); by Dr. Theodor Kuller; 384 pages, 5 by 7 in. A. Hartleben, Vienna and Leipsic. Price $1.50.

This book is divided into sections, each one of which is devoted to a special industry whose extent or importance may not warrant the treatment of the subject in a separate volume. Among the subjects treated are the following: baking, bookbinding, candy manufacture, gelatine and glue, cheese, cosmetics, chalk, liquor, lemonade and fruit essences, perfumery, photographic specialties, soap, etc.

Cotton Weaving and Designing; by F. Wilkinson, Director of the Textile and Engineering School of Bolton, England. 331 pages, 4 1/2 by 7; Longmans, Green & Co., London, New York and Bombay. Price $2.50.

The fifth edition of this work on cotton weaving and designing contains about 40 pages of new matter, while the body of the work has been carefully revised to make it conform to the latest development in the art of weaving. It is, therefore, an even more valuable hand book than heretofore. The following abstract of the table of contents shows the scope of the work; preparatory processes; hand and power looms; drop and circular box looms; dobbies; miscellaneous; Jacquard weaving; leno weaving; Terry looms-card cutting-lappets; the principles of designing; figured design, and textile calculations.

Business Literature.

Punches and Shears; Buffalo Forge Co., Buffalo, N. Y.

An illustrated catalogue describing the various types of punches and shears made by this company.

Telpherage; Dodge Coal Storage Co., Philadelphia, Pa.

An illustrated catalogue describing the various devices for transporting materials, manufactured by this concern. They are based on the trolley system and may be adapted for driveways, rivers and streets, as well as for the interior of workshops, warehouses and factories.

A New Process in Spinning; The Standard Spinning Machine Co., 1109 Empire Building, Pittsburg, Pa.

The new process machine for spinning woolen yarn by the continuous process on a ring frame, which was described in a recent issue of this magazine, is illustrated in detail in this circular. This continuous process for woolen yarn has attracted much attention in Europe and this country. Every woolen manufacturer should get a copy of this circular and investigate the merits of the new process machine.

Bleaching and Finishing Machinery; Arlington Machine Works, Arlington, Mass.

A catalogue describing and illustrating the bleaching and finishing machinery made by the Arlington Machine Works. Besides these machines they make a full line of cloth openers and folders, sewing machines, and continuous crabbing or lustring machines for woolen and worsted dyers and finishers.

Labor-Saving Looms. Second ed. 1905. The Draper Company, Hopedale, Mass.

The new edition of this work, treating of the Draper looms, has been brought up to date and contains much new and interesting material, showing the steady progress made in placing this line of looms in American mills.

Printers' Ink. Printers' Ink Publishing Co., 10 Spruce St., New York.

The issue of this publication for September 6th is especially interesting. It contains a great deal of practical information regarding advertising, and should be in the possession of everyone who is desirous of presenting his products favorably before the purchaser.

The Howard & Bullough American Machine Co., Pawtucket, R. I., have just issued a new illustrated descriptive pamphlet of their new pattern spinning frame. This pamphlet is liberally illustrated and fully describes the machine and all its principal parts.

Engineering Trades Catalogues and Literature.

Unique among latter day features of new things is the business of the Russell-DeWolfe Co., 355 Dearborn St., Chicago. Composed of O. W. Russell, for many years in charge of the advertising departments of some of the largest machinery concerns in the United States, and E. C. DeWolfe, M. E. a graduate of Purdue University and late mechanical editor of the Iron Age, New York, they contract to compile, edit and publish catalogues, booklets and house organs of a technical nature to meet the requirements of mill supply and general machinery trades. Just from the press is a 1036-page mill supply catalogue for the Smith-Courtney Co., Richmond, Va., which book comprises some 2700 illustrations of tools and machinery for the mine, mill, contractor, saw-mill, machinist and railroad. Another work just out is a 160-page catalogue for the Buckeye Iron & Brass Works, Dayton, Ohio, upon the line of cotton seed and linseed oil mill machinery made by this concern. Original booklets for the Dodge Mfg. Co., Mishawaka, Ind.; Pittsburgh Gage & Supply Co., Pittsburgh, Pa.; The Lunkenheimer Co., Cincinnati, Ohio, etc., still further emphasize the broadness of the work as executed by the above company.

Willcox & Gibbs Trade-Marks.

The final registration under the new trade-mark law has been made in favor of the Willcox & Gibbs Sewing Machine Co., of four trade-marks, two of which are of especial interest to the hosiery and underwear trade, viz, the word "Overlock," as applied to sewing machines and sewing machine attachments and parts, and the word "Overlock" as applied to seams, hems, welts and overedging. This word has been continuously used in the business of the company since 1886. Another trade-mark registered is the letters and character "W & G" as applied to sewing machine parts and attachments, while the fourth is the well-known picture of a sewing machine head resembling the letter "G," combined with needles arranged to form the letter "W" in monogram style. These trade-marks were registered in the United States patent office under the old law, which, however, did not grant so complete protection as the new one does, the latter applying to interstate commerce as well as to commerce with foreign countries.

Consolidation of Water-Tube Boiler Interests.

A consolidation of much interest to the engineering world has just been consummated through the amalgamation of the water-tube boiler business of the Aultman & Taylor Machinery Company, of Mansfield, Ohio, and the Sterling Company of Barberton, Ohio, as a result of which a company will be organized with a capital of $4,500,000. The position of the new company will be unique in that it will be able to supply to the trade practically every type of water tube boiler. In addition to manufacturing boilers of the Stirling and Cahall horizontal and vertical types, it will shortly take up and place upon the market an improved water tube boiler of the water leg type. Details in respect to the organization of the company have not, as yet, been worked out, but it can probably be assumed that the consolidation will be one of organization as well as of plants. The business will be handled through the foreign connections of the Stirling Company in its offices in Johannesburg, S. A.; Havana, Buenos Ayres, Yokohama and Hawaiian Islands, etc., as well as through its stock connection with the Stirling Company, Ltd., of Edinburgh, which is a prominent factor in the water tube boiler business of Great Britain and the Continent.

The Stirling Company was organized in 1890, and in 1898 established its marine department, securing control of the United States patents on the Niclausse, Yarro boilers. Its growth is illustrated in an increase of sales in eight years of nearly 800 per cent. The development of the Cahall sales department of the Aultman & Taylor Machinery Company has formed an equally important part of recent American industrial history. The new company thus starts with enviable prestige and with every facility for both manufacturing and selling. The general offices will be at 111 Broadway, New York.

Success of the Doupe Cutting Machine.

A few months ago we described the new doupe cutting machine brought out by James A. Cameron, Brooklyn, N. Y., and predicted for it a marked success as it filled a want, especially in the silk and velvet trade. Mr. Cameron informs us that he now has orders from all the velvet manufacturers in the United States as well as among broad silk manufacturers and dye works and finishing establishments. A number of cotton bleacheries and other manufacturers are taking lively interest in his machine adapted for the toweling processes.

An Important Purchase.

The Curtis & Marble Machine Co., of Worcester, Mass., has bought the business, good will and title of the Miller Press & Machine Co., of Woonsocket, and transferred it to Worcester. The building of the Miller flexible bed press and the repairs and parts business formerly carried on by the Miller Co., will receive prompt attention at Worcester. Mr. Miller is to associate himself with the Woonsocket Electric Light Co.

Heating and Ventilating.

The London Branch of the Buffalo Forge Company has received a very interesting order for heating and ventilating the various buildings of His Majesty's dock yards at Portsmouth. There are seven separate plants of large size, each comprising apparatus of the same capacity. The engineers of the Buffalo Forge Company's London office, in studying the requirements and existing conditions of the buildings, decided upon the use of specially designed fans. Likewise the 56 heaters to be used in the installation are of special construction.

Colonial Cotton.

In a recent report the Colonial Secretary in Gambia, states that the result of cotton growing in that colony has been an almost complete failure.

"Raw cotton," he says "shows an increase of 58,917 lbs. This is due to the high price that was paid for seed cotton in the Protectorate as an inducement to the people to cultivate it more largely. The trade, as far as Gambia is concerned is, however, a failure, and I may mention that the greater quantity of what was exported in 1904 was grown in French territory, and was brought into the Gambia Protectorate to be sold because of the better price obtainable for it there. It is feared that the cultivation of cotton in this colony is impossible, the soil being too sandy. The endeavor on the part of the Government and the British Cotton Growing Association to foster the trade has resulted in a substantial loss. The people will take little or no interest in the cultivation, and such cotton as they do grow they prefer to keep for their own consumption for the making of 'pagna' (native cloths) rather than sell it at a price at which it would pay to export the product."

The results in Mombassa, another British colony, are more encouraging. A report issued by the Colonial Office states that "the Egyptian brown cotton yield was 1,430 lbs. per acre. This would yield about 430 lbs. of fibre. The first instalment of the crop (900 lbs.) was sold at home for 10 1/2 cents per pound (American 4 1/2d.), and the following report was received: 'Clean, well prepared, staple a little irregular, but long and a good result, value 10 1/2 cents per pound.' The first harvest is usually the best, so the whole crop may not average more than 10 cents per pound. This would, however, give a return of about $45.00 per acre. The value of the seed may be taken as sufficient to cover the expense of ginning and transport. The harvesting cost roughly was 1 1/2 cents per pound of lint, and the cultivation is estimated to have cost $15.00 per acre. The total cost of production would, therefore, be under $25.00 per acre. During the first year, when there are many capital charges, such as road making, building stores, clearing out brush, any estimate of expenditure can only be approximate. However, as long as it is possible to produce 1,400 lbs. of cotton per acre of a quality worth even 4d. per pound the cultivation of cotton would be profitable."

James E. Daly.

In another part of this issue will be found the announcement of James E. Daly, 72 Leonard St., New York City. He is a dealer in all kinds of textile fibres, making a specialty of cotton combers and strips, garnetted worsted, wool and silk stocks. Mr. Daly was in the wool extract business at Paterson, N. J., for more than ten years, and previous to that time was connected with the New York cotton market for fifteen years. He has a wide acquaintance with the woolen and cotton mills of the country and understands thoroughly the various requirements of the different manufacturers. He is in a position to supply Tussah silk waste in any form desired. This material is coming into general use as a substitute for wool, reference to it being found in the editorial columns of this issue. His mill is well equipped for cleaning this waste and preparing it for the use of the manufacturer. He also handles other grades of silk stock in white, black and mixed shades suitable for piece dyeing. Mr. Daly makes a specialty of mercerized cotton yarn and is prepared to supply worsted and wool yarn as well.

Air Moving Machinery.

The Green Fuel Economizer Co. of Matteawan, New York, has just completed the erection of a large shop designed to provide for its rapidly increasing business. This company not only supplies special exhausters with bearings removed from the action of the flue gases for mechanical draft in connection with the widely used Green fuel economizer, but also builds fans, blowers and exhausters for every purpose, having, for instance, recently sold fans for heating, ventilating and humidifying in textile mills, ventilating and drying in paper mills, heating and ventilating in large buildings, etc. It is just now installing the largest mechanical draft exhauster ever built for a factory in Massachusetts.

New designs have been worked out for all types of "Green-Matteawan" fans with the special object of reducing the power required for driving. Fans are often driven by small non-condensing engines or by electric motors using purchased electric power, so this is quite an important matter. Fan builders, however, under the stress of competition and to increase profits, have frequently offered small, inefficient, high-speed fans where true economy for the purchaser would have indicated larger, slower moving fans. It should be remembered that the power consumed by a fan runs up very rapidly with the speed.

The Green Fuel Economizer Co. does not contract for the engineering of plants, or for the installation of heating and ventilating plants in competition with the heating and ventilating contractors, but freely offers the advantages of its engineering skill and sixty years' experience in the construction and operation of air-moving plants.

The Crompton-Thayer Loom.

Beebe Webber Co. of Holyoke, Mass., have placed an order with the Crompton-Thayer Loom Co. of Worcester, Mass., for twenty-four heavy worsted looms.

The Nasmith Comber.

We desire to draw attention to the attractive advertisement of Stephen C. Lowe on page 9 of this issue, showing the floor plan and equipment of Nasmith combers. The manner in which this machine has been received by manufacturers is most gratifying, not only to the builders, John Hetherington & Sons, Ltd., of Manchester, Eng., but also to their agent, Mr. Lowe. Over fifty machines have been placed in mills within a year, which is strong evidence in favor of the machine in question. In addition to the comber, Hetherington & Son manufacture a full and complete line of cotton machinery.

The Putnam-Hooker Co.

This company, which, prior to its incorporation and since, has been in successful operation in Cincinnati, Chicago and St. Louis for over thirty years, desiring to still further expand its business, has opened an office in New York, in the New York Life Building. This is in charge of the secretary, Kenneth R. Hooker, and Robert A. Johnston, the latter having for some years been in charge of our Chicago office.

The advantages offered in New York for developing and increasing business on Southern cottons for the export, manufacturing and converting trades, have induced the carrying out of this plan, which has been in contemplation for several years.

The New York representatives are energetic young men, very thorough-going, and with some ten years' experience in the cotton goods trade.

Knit Novelty.

In the Special Want Ads in this issue appears a small ad in relation to what is claimed to be a new idea in knitting sweaters and similar goods on flat machines. The inventor believes it can be made most profitable if properly developed. He is desirous of introducing the system to manufacturers. Samples that we have seen are very attractive.

Selling Patents.

It frequently happens that inventors are at a loss as to the best way of disposing of their foreign patent rights. Mr. F. C. Hinckley, 143 Liberty St., New York City, is a broker for the sale of foreign and domestic patents, and makes a clear and plain contract relative to the sales and which tells just what he will do.

Business of this kind requires a responsible and trustworthy broker, and parties who know Mr. Hinckley speak in high terms of him in this respect. He gives as references many men of high standing. It frequently happens that the sale of foreign rights which the inventor is not in a position to exploit personally, will furnish the means of starting a business in the home field. Mr. Hinckley's proposition seems to be worthy of investigation.

Albany Grease.

A good idea of what Albany grease will accomplish may be obtained from the experience of W. Cook, chief engineer of Hotel Robinson, San Diego, Cal., who writes Adam Cook's Sons, 313 West St., New York City, the only makers, as follows:

"I have given your grease a hard test, with the result that it will be the only lubricant used in our plant. The result of a trial on the crank of our 14 by 20 Atlas engine (which required three pints of engine oil for a five-hour run, and then ran hot) was that a No. 2 "Perfect" compression cup, holding one-quarter pound of grease, was sufficient to lubricate the crank pin referred to for twenty days or fifty hours' running, and on all other bearings the grease was equally satisfactory. No. "X" gives better satisfaction than Nos. 2 and 3, which you sent, owing to the tropical climate."

The Wool Market in the West.

Never before have sheep values soared as high as they have this fall; that is all along the line. For example, two and three-year-old ewes are worth $3.50 a head, wethers of the same age are worth $3.25 a head and last spring's lambs are selling at $2.25. These are average prices and they are fully a half a dollar a head, in each case, more than the same stock was bringing a year ago.

And there is a lively local market for the woolly animals at the above prices. There are practically no sheep on the market at the persent time, for whenever there is a band offered for sale, there is a buyer on hand immediately to snap it up. Where, in former years, the firm of J. B. Long & Co. had hundreds of thousands of sheep listed for sale, they have now practically none. And the prices at which the sheep are selling this fall are higher, all classes of stock being considered, than were ever before paid for sheep in the West, in the memory of the oldest man in the business. This refers, of course, to the local market, caused by the demand of local sheep men, who wish to replenish their stock and increase their holdings.

There are probably several reasons for the high sheep market, but no doubt the principal cause of it is the high price paid for wool during the past season. When four pounds of unshrunken wool, greasy and full of dirt, as it is taken from the sheep's back, will fetch $1, the sheep business looks pretty good to any man. There were several sales of individual holdings of wool that ran up into the hundreds of thousands of dollars this season.

The Canadian authorities appear to be watching out for Montana sheepmen who graze their flocks across the line. An outfit of about 3,000 head, owned by P. McCann of Cleveland, was seized by the mounted police a few days ago, and is being held for double duty, which will amount to about $1.20 per head. The McLaren sheep, which were seized about three weeks ago, are still in possession of the mounted police, no arrangement having been made for their release.—Great Falls (Mont.) Leader.

Loom Parts.

On another page of this issue will be found the advertisement of the Glaser Mfg. Co., mechanical engineers at 2731-33-35 North 6th St., Philadelphia, Pa. They make a specialty of supplying Crompton & Knowles loom parts to manufacturers using looms of this class; also the grinding and repairing of all kinds of shearing machines. They are also in a position to do repairing of all kinds on textile machinery and invite manufacturers who have work of this kind to be done to give them a call.

The Fairhill Bleachery.

Thomas Hulme, the senior member of the late firm of Hulme, Clements & Co., recently dissolved, has formed a partnership with Edward A. Schneider, and they are now operating the bleachery formerly run by the old concern at 2803-5-7 Fairhill St., Philadelphia, Pa., under the name of the Fairhill Bleachery, where they are bleaching cotton goods of all descriptions, such as yarns, tapes, webbing and piece goods

Art Square and Ingrain Carpet Looms.

The Crompton-Thayer Loom Co., which was organized something over two years ago, will bring out art square and ingrain carpet looms during the coming year.

These looms will undoubtedly be distinguished for symmetry, simplicity and strength, which qualities have been much in evidence in the types of Crompton & Thayer looms already developed. The art square and ingrain carpet looms will be built along approved lines, but will have some patented devices which will undoubtedly appeal strongly to the trade.

The company is now so rushed with orders that it will be unable to bring out these looms until well into the coming year.

The Crompton-Thayer Loom Co. is an entirely independent firm, Mr. George Crompton and Mr. Randolph Crompton being both actively identified in the management of the company.

Wages in the African Cotton Fields.

The British Cotton-Growing Association denies emphatically a statement, which has appeared in a number of newspapers, alleging that the association is paying the natives at their model cotton-growing plantations in West Africa only 12 cents per week, and that a condition of semi-slavery prevails among their employes. The wages actually paid, the association adds, are at the standard rate current in West Africa, viz., 12 to 24 cents per day, and the conditions which obtain are known and cordially approved by the local representatives of the British government and by the native chiefs. The association further states that, so far as they have been able to trace them, the allegations in question seem to have emanated from Belgian or American sources.—Textile Mercury.

Tussah Silk Waste.

Frank A. Tierney, 260 West Broadway, New York city, desires to announce that he is in a position to supply manufacturers with a superior grade of Tussah silk waste, which is especially adapted for fine spinning by the regular carded woolen process and which is an excellent carrier for short stock. He is confident that the Tussah silk waste he has for sale is equal to any of this kind of stock in the domestic or foreign market.

Of Interest to Knitters.

We take pleasure in directing attention to the advertisement of the Continental Latch Needle Co., 120-122 Liberty St., New York, a concern which has made considerable headway in this country within the last few months, handling as it does the German needle exclusively. The Continental Latch Needle Co. are manufacturers of all kinds of latch and spring bearded needles, and carry a large stock in New York, their aim being to avoid all those delays and tiresome customs formalities, which the importers of German needles have found so irksome and annoying in the past.

The Continental Latch Needle Co., after many years of experiment, and constant improvement, now claim that their rivet is as near perfection as is possible, while a better finished and better tempered needle was never known on the American market. We would advise all our readers who are having trouble with their needles to correspond with them.

An International Exhibition at Tourcoing

The municipality and the Chamber of Commerce of the city of Tourcoing have decided to hold an international exhibition of textile industries from May to September of next year. The object of the exhibition is primarily to demonstrate the activity of the textile centres of the north of France, including Roubaix, Tourcoing, Lille, and Armentieres. In addition to the mechanical and electrical departments there are to be exhibits of chemical and dyeing products, cloths and furniture. It has been decided that all looms and other machines must be shown in motion, a rule which will be greatly appreciated by visitors to the exhibition.

The Jones Stokers in the Manchester Mills.

For something over eighteen months past the forty Manning fire tube boilers in the new boiler house of the Manchester Mills, Manchester, N. H., have been fired by the Jones under-feed system of mechanical stoking. The results have been such, both as to economy and capacity, as to lead to placing of a second order for twenty stokers to go under that number of Manning boilers shortly to be installed in the addition to present boiler room. These stokers are supplied by the Under-Feed Stoker Company, Marquette Building, Chicago, Ill.

Changes in Accounts.

Announcement is made that the arrangement between Thomas Leyland & Co. and Levinstein Limited, of Manchester, Eng., has by mutual consent been discontinued. On and after October 1, 1905, Thomas Leyland & Co. will no longer act as agents for the sale of the Levinstein aniline colors and coal tar colors. The latter concern have opened their own branch offices in Boston and Philadelphia, and appointed Edgar Levinstein general manager for the American business, which will be conducted under the name of I. Levinstein & Co. The Boston office will be at 74 India St., and the Philadelphia office at 121 North Front St. Thomas Leyland & Co., proprietors of the Readville Color & Gum Works, manufacturers and importers of dextrines, alizarine assistants, gums, softeners and all sorts of calico printers', dyers' and bleachers' supplies, maintain their Boston office at the old address, 53 India St., where they have been located for many years.

H. De Veer.

Tussah silk waste has, hitherto, been mainly used for making Tussah spun-silk yarns, which are employed in making plushes. At present, however, it is receiving a great deal of consideration, as being suitable for mixing with wool stock. H. de Veer, Wool Exchange building, 260 West Broadway, New York, has handled Tussah spun-silk yarns for many years, and has been engaged in supplying the necessary Tussah waste to spinners whose yarns he has been handling. He consequently has a thorough knowledge of the article, and is thoroughly in touch with the various sources of supply Anyone who contemplates using Tussah waste should apply to him for information. His long experience in this line enables him to supply at once all necessary information on the subject.

Trouble in Egypt.

Egypt is being troubled this year with a "cotton worm." This creature has been troubling planters for some time; but, hitherto, it has been kept in its proper place. This year, however, it has broken out in large numbers, and is doing considerable damage. There is likely to be a stiff fight between the worm and the authorities, and the Khedive has signed a decree which furnishes administrative bodies with full instructions to take the necessary steps to destroy the pest. Every boy between the age of nine and seventeen, is liable to be employed in this task under responsible supervision. A fixed wage is to be paid to him, and land owners who are willing to help in the campaign will be allowed a certainnnrt number of lads by the Government. Those who refuse to lend their aid will be fined heavily. All lads who refuse to take part in the work when called upon, are liable to a fine of 20s., or one week's imprisonment. This vigorous action on the part of the Goverment has been deemed necessary, owing to the happy-go-lucky attitude of the farmers when the pest is in its early stage.—Textile Journal.

The Arabol Manufacturing Co.

The "International Prize" starch is offered by the Arabol Mfg. Co., 100 William St., New York, as an improvement over the old-fashioned potato starch. It is a product highly recommended, especially for the sizing of fine and medium yarns. Among the claims for it are that it cooks thinner, is easily soluble and transparent, penetrates the yarn and lays the fibre. It is "slippery on the yarn," requires very little softening, and goes farther than the old starch. It is said to produce strong, smooth-sized warps and give the best sizing for Egyptian warps, as well as for mercerized and cotton yarns.

Easily Taken In.

From an unimpeachable German source we are informed that adventurers in the textile trade have practiced the following trick. They have forwarded cops dyed very perfectly throughout, in alizarine red, to a number of firms in France, and offered to sell a machine and process guaranteed to dye cops to this sample, on condition that a sum of £400 was deposited before delivery of the machine. At least seven firms have been taken in, and are still waiting for the delivery of non-existent machines. Our informants believe that the samples submitted were dyed in the hank and rewound, but this would be an extremely difficult process and would require a specially arranged spinning frame. We have compared these specimen cops with cops dyed in Lancashire, and are of the opinion that the adventurers have simply purchased the best articles in the market as samples of their own work. This, however, is a mere detail. The main point is that the two men have practiced a skilful fraud with much success, and are possibly planning new raids upon the industry. We trust that this warning will circumscribe their sphere of activity very considerably.—Dyer and Calico Printer.

Disease from Shuttles.

The Liverpool Institute of Tropical Research, although its work is merely in the initial stage, has already justified its existence. It has solved a problem that was causing uneasiness in certain Lancashire mills. Wood, imported as African boxwood, had been used in the construction of new shuttles for these factories. Soon after the shuttles were put in use a mysterious illness fell upon the operatives. Nothing like it was in the ken of the medical practitioners. Suspicion first fell upon one thing and then another, but examination proved the entire innocence of the supposed causes.

At last the Liverpool Institute was communicated with. Experts in botany were brought to the examination of the mills, and then it was discovered that the shuttles were made, not of boxwood, but of another tree that contained an alkaloid of deadly import.

Constant contact with this vegetable material had brought about the disease.—Cotton Factory Times.

Recent Textile Patents.

BALING PRESS. 800,009. Lee L. Parr, Pagosa Springs, Col.

BALING PRESS. 799,739. Frank A. Lake, Cassoplis, Mich.

BALING PRESS. 799,729. Albert Hailey, Ruston, La.

BOBBINS. Making Moisture Repellent. 797,702. Charles E. Nutting, Hopedale, Mass., assignor to Draper Co., Hopedale, Mass.

CARDING MACHINE. 797,749. Robert B. Robinson and Eddo V. Bates, Lowell, Mass.

COMBING MACHINE CYLINDER. 798,913. Robert Meyer and Joseph Perrin, Cours, France.

FABRIC FLOCKING MACHINE. 797,717. John M. Brown, West Philadelphia, Pa.

FILAMENTS FROM VISCOSE. Manufacturing 798,027. Charles A. Ernst, Lansdowne, Pa.

HEDDLE AND HEDDLE FRAME. 798,736. William S. Lackey, Haddonfield, N. J.

LOOM SHUTTLE. 797,477. Charles B. Webster, Fall River, Mass., assignor to James K. Lanning, Boston, Mass.

This invention relates to a loom-shuttle, and particularly the method of "hand-threading" wherein the filling-thread is guided by the hand of the weaver into the delivery-eye of the shuttle. It consists not only in improvements by which the construction of such shuttles is materially simplified and improved, but also in the provision of means whereby the threaded filling-thread is prevented from de-threading or entangling in the open

Fig 1

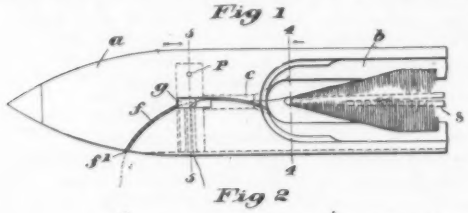
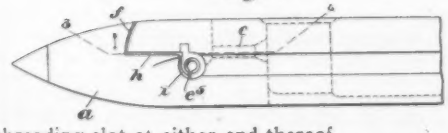


Fig 2



threading-slot at either end thereof.

In the drawings, Figure 1 shows in plan the head or forward end of a shuttle embodying one form of the invention, the threaded position of the yarn being shown in full lines and a position reached during threading being shown in dotted lines. Fig. 2 shows a similar view in side elevation.

LOOM TAKE-UP MECHANISM. 797,573. George Goodline, Philadelphia, Pa., assignor to Crompton-Thayer Loom Company, Worcester, Mass.

LOOM PATTERN MECHANISM. 798,764. Randolph Crompton, Worcester, Mass.

LOOM PICKER STICKS, Bunter for. 798,860. Alexander Allen, Jr., North Oxford, Mass.

LOOM for Producing Several Firm-Bordered Tissues Side by Side. Power. 798,472. C. Wilmsen, Viersen, Germany.

LOOM SHEDDING MECHANISM. 797,967. William J. Lutton, Paterson, N. J.

LOOM TAKE-UP MECHANISM. 799,804. Otto W. Schaum, Philadelphia, Pa.

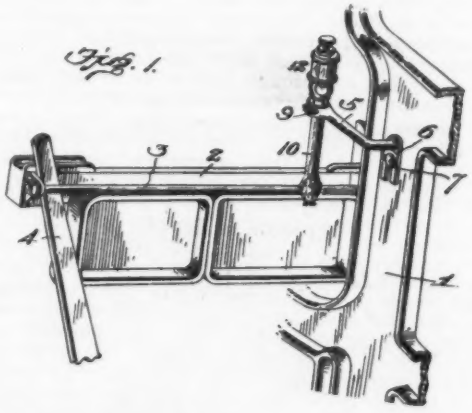
LOOM TEMPLE. 797,602. Frederick Ott, Woonsocket, R. I., assignor to Crompton & Knowles Loom Works.

SPINDLE. 798,254. Victor Belanger, Seaview, Mass.

SPINDLE OILER for Looms. 798,084. Charles F. Thompson, Oswego Falls, New York.

The object of the invention is to provide a device of this character by which the spindle or picker-rod will be kept continually oiled or lubricated, thereby preventing the rods from getting dry and hot, and the consequent wearing and sticking of the picker-staffs.

Fig. 1.



A further object is to provide an oiling device of this character in which the feeding of the oil may be seen and the discharge regulated.

In the accompanying drawings, Fig. 1 is a perspective view of a portion of a loom, showing the application of the invention.

SPINNING MACHINE Yarn Traverse Regulating Device. 798,289. George P. Miller, Philadelphia, Pa.

STOCKING PRESSING MACHINE. 798,204. John F. Nelson, Rockford, Ill.

WEAVING APPARATUS, HAND. 798,559. Mary E. Bartlett, Baltimore, Md.

C. E. RILEY & CO.

65 Franklin Street, .. BOSTON, MASS.

BUILDERS AND IMPORTERS OF

COTTON WOOLEN WORSTED

MACHINERY

DIRECT .. .. IMPORTERS OF **EGYPTIAN COTTON**

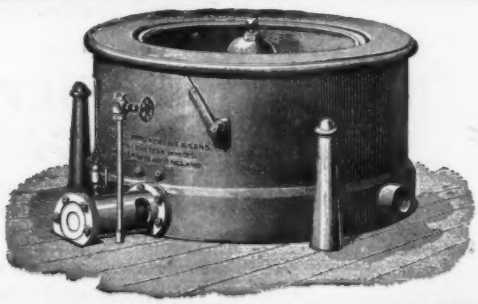
Thomas Broadbent & Sons,

Huddersfield, Eng.

PATENT DIRECT STEAM DRIVEN

HYDRO-EXTRACTORS

OVER 3500 IN USE. ALSO ELECTRICALLY DRIVEN



SUSPENDED ON LINKS. REQUIRING NO EXPENSIVE FOUNDATIONS

C. E. RILEY & CO., Sole Agents 65 Franklin St., Boston, Mass.

Machines Kept in Stock in Boston

HANSCOM BROTHERS,

MANUFACTURERS OF

BRAIDS AND TAPE.

FALL RIVER, MASS., May 3d, 1905.

Cling-Surface Co.,
Boston Branch, 170 Summer Street, Boston, Mass.

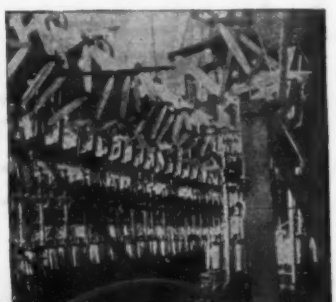
Gentlemen: We are pleased to give you our experience with Cling-Surface. We have always known that a slack belt means money saved. To gain this end we used many dressings, but none of them would do the work for more than a few days without another application of the dressing. We decided to run a tight belt rather than put an idler on the arc. Cling-Surface was brought to our attention and we gave it a trial, with the result that we put a new main belt on, first giving it a thorough treatment on both sides with Cling-Surface. Result: we have the easiest running belt; least wear of counter, motor and hangers in this section. Our main belt is today in perfect condition. We have never had the least trouble with it. The same lacings still hold where we put them two years ago. Our other belts show the same perfect condition.

Our belt (shown in picture) runs 1200 feet per minute and is belted from a 25 h. p. motor, 6-inch pulley, to a counter 35-inch pulley. Distance between centers, 10 feet. The belt, which is a 6-inch double, takes the place of an 8-inch belt we took off, and does more work, with less power, than the old one. We will stand back of our statement.

We have had many men who were conversant with the advantages of easy running belts, see our belts, and their opinion is that we have perfect running belts. We, therefore, after giving Cling-Surface two years' trial, and use, to our entire satisfaction, recommend it as a power, labor and worry saver.

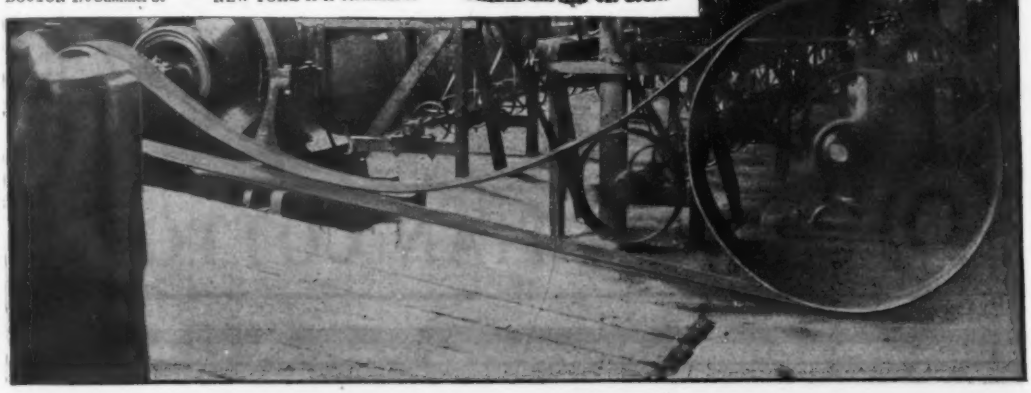
HANSCOM BROS.

Send for a trial package of Cling-Surface.



CLING-SURFACE CO 198-205 Virginia Street Buffalo N Y

BOSTON 170 Summer St NEW YORK 39-41 Cortlandt St PHILADELPHIA The Bourse



Lunkenheimer "Graphite" Lubricators

ARE THE ONLY RELIABLE ONES for Feeding Graphite to Steam Cylinders and Pumps.

VERY ECONOMICAL AND PROLONG THE LIFE OF THE ENGINE.

Graphite Fed Automatically and Continuously in Any Desired Quantity.

If your local dealer cannot furnish them, notify us,

THE LUNKENHEIMER COMPANY,

LARGEST MANUFACTURERS OF HIGH GRADE ENGINEERING SPECIALTIES IN THE WORLD.

GENERAL OFFICES AND WORKS:
CINCINNATI, OHIO, U. S. A.

BRANCHES:
New York, 26 Cortlandt Street.
London, S. E., 35 Great Dover Street.

We manufacture a complete line of Iron and Brass Valves, Cocks, Hydrostatic and Mechanical Lubricators, Whistles, Oil and Grease Cups, Water Columns and Gauges, Injectors, Ejectors, Pop Safety, Relief and Blow-off Valves, Fittings, Etc. 4 T.W.R.

Buyers' Index.

The addresses of builders of mill machinery and dealers in mill supplies, whose names appear in the following classified index, may be found upon referring to their advertisement. The Alphabetical Index to advertisers follows this classified list. Buyers who are unable to find in these classified lists such machinery or supplies as they desire, are invited to communicate with the publishers, who can, in all probability, refer them to proper sources.

Advertisers whose names do not appear under desired headings will please notify the publishers. Such omissions are accidental, not intentional.

Accountants, Public.
Cathrall, W. M.

Air Moistening System.
American Moistening Co.
Bell Pure Air & Cooling Co.
Schutte & Koerting Co.

Architects and Mill Engineers.
Ballinger & Perrott.
Dean & Main.
Ferguson, John W.
Suck, Adolph.

Auditors.
Cathrall, W. M.

Automatic Feeds for Cotton and Wool.
American Drying Machinery Co.
Harwood, Geo. S. & Son.
Kitson Machine Co.
Leigh, Evan A.
Philadelphia Drying Machinery Co.
Philadelphia Textile Machinery Co.
Schofield, Wm. Co.
Woonsocket Machine & Press Co.

Back Combustion Chamber Arch.
McLeod & Henry Co.

Balling Machine.
North Chemsford Machine Co.
Torrance Mfg. Co.

Bandings.
—See under Yarns.

Baskets.
Lane, W. T. & Bro.
Morris & Co.

Belting.
Boston Belting Co.
Main Belting Co.
Shultz Belting Co.
Turner, J. S., Mfg. Co.
—See also Mill Supplies.

Belt Dressing.
Boston Belting Co.
Cling Surface Mfg. Co.
Dixon, Jas., Crucible Co.
Shultz Belting Co.
Stephenson Mfg. Co.

Belt Lacing Machines.
Birdsboro Steel Foundry & Machine Co.

Bindings.
—See Tapes and Braids.

Bleaching Kiers.
Allen, William Sons Co.
Arlington Mch. Wks. (Arthur Birch, prop.)
Textile Finishing Machinery Co.

Bleaching Materials.
Bosson & Lane.
Roessler & Hasslacher Chemical Co.

Blowers and Blower Systems.
American Blower Co.
Barney Ventilating Fan Works.
Boston Blower Co.
Buffalo Forge Co.
Green Fuel Economizer Co.
Mass. Fan Co.
New York Blower Co.
Philadelphia Drying Machinery Co.
Schutte & Koerting Co.
Sturtevant, B. F., Co.
Schnitzler, Chas. H.

Bobbin Machinery.
Defiance Machine Works.

Bobbins, Spools, Shuttles, Etc.
American Textile Specialty Mchy. Co.
Leigh, Evan A.
Tebbets, E. L. & Co.

Boiler Arches, "Steel Mixture."
McLeod & Henry.

Boiler Inspection and Insurance.
—See Steam Boiler Insurance.

Boiler Setting.
McLeod & Henry.

Boilers.
—See Steam Boilers.

Boxes, Cloth Boards, Etc.
Pearson, J. T.

Boxes (Paper).
—See Paper Boxes.

Braiding Machinery.
New England Butt Co.
Textile Machine Works.

Braids.
—See Tapes, Braids and Edgings.

Brass (Perforated).
—See under Perforated Metal.

Brazing.
Ferrofix Brazing Co.

Brushers.
—See Napping Machines.

Brushes.
Felton, S. A. & Son Co.
Mason Brush Works.

Burr Pickers.
Curtis & Marble Machine Co.
Sargent's, C. G., Sons.
Smith & Furbush Machine Co.

Burlaps.
Stoddard, Haserick, Richards & Co.

Buttons.
Davenport Pearl Button Co.
International Button Co.

Calico Printers' Machinery and Supplies.
Arlington Mch. Wks. (Arthur Birch, prop.)
Butterworth, H. W. & Sons Co.
Taunton, New Bedford, Copper Co.
Textile Finishing Mchry. Co.
—See also Dyeing, Bleaching, Machinery, etc.

Canvas Baskets.
Lane, W. T. & Bro.
Morris & Co.

Carbonizing.
Riverdale Woolen Co.

Carbonizing Machinery.
American Drying Machinery Co.
Philadelphia Drying Machinery Co.
Philadelphia Textile Machinery Co.
Sargent's, C. G., Sons.

Card Clothing.
Ashworth Bros.
Bowes, L. M., Co.
Leigh, Evan A.
Riley, C. E. & Co.
Stoddard, Haserick, Richards & Co.

Card Feeds.
—See Automatic Feeds.

Card Grinding Machinery.
Entwistle, T. C., Co.
Leigh, Evan A.
Riley, C. E. & Co.
Smith & Furbush Machine Co.
Stoddard, Haserick, Richards & Co.

Carders' Tools.
Brown, W. H.

Carpet Machinery.
Altemus, Jacob K.
Curtis & Marble Machine Co.
Philadelphia Textile Machinery Co.
Smith & Furbush Machine Co.

Castings.
Farrell Foundry and Machine Co.
Ferrofix Brazing Co.
Link Belt Engineering Co.
Lunkenheimer Co.
Schofield, Wm., Co.

Chain Blocks and Hoist.
Yale & Towne Mfg. Co.

Chemical Apparatus.
Weeks, A. J.

Chemicals.
American Chemical Co.
Barrett Mfg. Co.
Roessler & Hasslacher Chemical Co.
Solvay Process Co.

Chemists.
Little & Walker.

Cling Surface.
Cling Surface Mfg. Co.

Clocks.
Pettes & Randall Co.

Cloth Boards.
Chaffee Bros.
Pearson, J. T.
Shyrock, J. K.
Smyth, J. L. N. Paper Co.

Cloth Cutting Machinery.
—See Cutting Machinery.
Cameron, James A.

Cloth Stretchers.
Arlington Mch. Wks. (Arthur Birch, prop.)
Leyland, Thomas & Co.
Textile Finishing Machinery Co.

Clutches.
American Tool & Machine Co.
Humphrey Machine Co.
Hunter, James, Machine Co.
Klein, Chas. C.
Link Belt Engineering Co.
Reeves Pulley Co.

Comb Aprons.
Turner, J. S., Mfg. Co.

Comb Pins and Needles.
Dean, John M.

Combs Repaired and Rolls Refluted.
Baker Machine Corporation.

Combs (Wool and Cotton).
Dean, John M.
Hood, R. H.
Leigh, Evan A.
Philadelphia Textile Machinery Co.
Riley, C. E. & Co.
Stoddard, Haserick, Richards & Co.

Concrete Work and Construction.
Simpson Bros. Corporation.

Condensers.
Schutte & Koerting Co.

Conveyors, Pneumatic.
—See Blowers & Blower Systems.

Conveying Machinery and Chains.
Dodge Coal Storage Co., United Telpherage Dept.
Link Belt Engineering Co.

Cop Spindles.
American Textile Specialty Mchy. Co.

Cop Tubes.
American Textile Specialty Mchy. Co.
—See Paper Tubes.

Copper (Perforated).
—See under Perforated Metal.

Copper Print Rollers.
Rome Metal Co.
Taunton, New Bedford, Copper Co.

Copper Stamps.
Atlas Copper Stamp Works.

Coppersmiths.
Badger, E. B. & Sons Co.

Copper Work for Dyers.
Butterworth, H. W. & Sons Co.
Textile Finishing Machinery Co.

Cotton.
Blaisdell, S., Jr., Co.
Charles, W. B.
Riley, C. E. & Co.
Stoddard, Haserick, Richards Co.

Cotton Elevators.
Buffalo Forge Co.

Cotton Machinery.
Altemus, Jacob K.
American Textile Appliances Co.
American Textile Specialty Mch'y Co.
American Drying Machinery Co.
Ashworth Bros.

Alphabetical Advertising Index, with page numbers, follows this list.

Cotton Machy—cont.
Baker Machine Co.
Barber & Coleman Co.
Barker, James.
Butterworth, H. W. & Sons Co.
Crompton & Knowles Loom Works.
Crompton-Thayer Loom Co.
Cohoes Foundry & Machine Co.
Coldwell-Gildard Co.
Curtis & Marble Machine Co.
Draper Company.
Easton-Burnham Co.
Elliott & Hall.
Hetherington, John & Sons, Ltd.
Kitson Machine Co.
Leigh, Evan A.
Lowe, S. C.
Lowell Machine Shop.
Mason Machine Works.
Metallic Drawing Roll Co., The.
North Chelmsford Machine Co.
Philadelphia Drying Machinery Co.
Philadelphia Textile Machinery Co.
Providence Machine Co.
Riley, C. E. & Co.
Saco & Pettee Machine Shops.
Schofield, Geo. L.
Smith & Furbush Machine Co.
Stafford, G. W., Mfg. Co.
Stoddard, Haserick, Richards & Co.
Textile Finishing Machinery Co.
Vacuum Dyeing Machine Co.
Whitin Machine Works.
Entwistle, T. C., Co.
Firth, William, Co.
Howard & Bullough American Mach. Co.
Kilburn, Lincoln & Co.
Woonsocket Machine & Press Co.

Cotton Openers and Lappers.
Howard & Bullough American Mach. Co.
Kitson Machine Co.
Leigh, Evan A.
Riley, C. E. & Co.
Stoddard, Haserick, Richards & Co.

Cotton Softeners.
Bosson & Lane.
Warren Soap Mfg. Co.

Cotton Waste.
Blaisdell, S., Jr., Co.
Charles, W. B.

Crayons.
Dixon, Jos., Crucible Co.
Lowell Crayon Co.

Cutter for Knit Goods.
Eastman Machine Co.
Langston, Samuel M.

Cutting Machinery.
Cameron, James A.
Eastman Machine Co.

Dextrine.
Standard Starch Co.
Stein, Hirsh & Co.

Dobbies.
Crompton & Knowles Loom Works.
Crompton-Thayer Loom Co.
Stafford, G. W., Mfg. Co.

Drawing Rolls.
Hood, R. H.
Metallic Drawing Roll Co., The.

Dryers.
American Blower Co.
American Drying Machinery Co.
Arlington Mch. Wks. (Arthur Birch, prop.)
Birch, Arthur, Arlington Mch. Wks.
Boston Blower Co.
Buffalo Forge Co.
Butterworth, H. W. & Sons Co.
Hunter, Jas., Machine Co.
Kenyon, D. R. & Son.
Mass. Fan Co.
Philadelphia Drying Machinery Co.
Sargent's, C. G., Sons.
Sturtevant, B. F., Co.
Textile Finishing Machinery Co.
Whiteley, William, & Sons, Ltd.
Vacuum Process Co.

Drying Boards.
Bull, William C.
Pearson, J. T.
Wisconsin Mfg. Co.

Dusters.
——See Wool and Waste Dusters.

Dust Collectors.
Allington & Curtis Mfg. Co.
Philadelphia Drying Machinery Co.

Dyers, Bleachers and Finishers.
Brophy's, T., Sons.
Cranston Worsted Mills (Yarns).
Davidson, J. F.
Fairhill Bleachery.
Fawell, Arthur.
Firth & Foster Co.
Greenwood, R. & Bault.
Home Bleach & Dye Works.
Ingrahamville Dye Works.
Lorimer's, The Wm. H. & Sons Co.
Maryland Bleach & Dye Works.
Pawtucket Dyeing & Bleaching Co.
Peerless Co.
Providence Mills Mfg. Co.
Rowland, Samuel.
Western Textile Fibre Co.

Dyeing, Drying, Bleaching and Finishing Machinery.
Aiton Machine Co.
Allen, William, Sons Co.
American Blower Co.
American Drying Machinery Co.
American Dyeing Machine Co.
Arlington Mch. Wks. (Arthur Birch, prop.)
Birch, Arthur, Arlington Mch. Wks.
Buffalo Forge Co.
Butterworth, H. W. & Sons Co.
Curtis & Marble Machine Co.
Entwistle, T. C., Co.
Fabric Measuring & Packaging Co.
Fries, John W.
Gessner, David.
Harper Mfg. Co.
Heathcote, John & Son.
Heusch, Severin.
Hopkins Machine Works.
Kenyon, D. R. & Son.
Klauder-Weldon Dyeing Machine Co.
Klipstein, A. & Co.
Leigh, Evan A.
Leyland, Thos. & Co.
Parks & Woolson Machine Co.
Philadelphia Drying Machinery Co.
Philadelphia Textile Machinery Co.
Phoenix Iron Works Corp.
Rodney Hunt Machine Co.
Smith, Drum & Co.
Sturtevant, B. F., Co. (Drying).
Textile Finishing Machinery Co.
Vacuum Dyeing Machine Co.
Vacuum Process Co.
Whiteley, William, & Sons, Ltd.

Dye House Cans.
Hill, James, Mfg. Co.

Dye Sticks.
Bailey, Frank.
Haedrich, E. M.

Dye Tubs.
——See Tanks, Tubs and Vats.

Dyestuffs and Chemicals.
American Chemical Co.
American Dyewood Co.
Atteaux, F. E. & Co.
Barrett Mfg. Co.
Berlin Aniline Works.
Bischoff & Co.
Bosson & Lane.
Cassella Color Co.
Kalle & Co.
Farbenfabriken of Elberfeld Co.
Ford, J. B., Co.
Geigy Aniline & Extract Co.
Geisenheimer & Co.
Johnson, Chas. A. & Co.
Klipstein, A. & Co.
Kuttroff, Pickhardt & Co.
Leyland, Thos. & Co.
Metz, H. A. & Co.
Nicol, J. M. & J. S.
Roessler & Hasslacher Chemical Co.
Solvay Process Co.
Sykes, Walter F. & Co.
Thayer, Ed. M.
Vila, H. S.
West Indies Chemical Works, Ltd.

Dynamos.
——See Electric Lighting.

Edgings.
——See Tapes, Braids and Edgings.

Electrical Construction.
Crocker, Wheeler & Co.
General Electric Co.
Mechanical Appliance Co.
Sturtevant, B. F., Company.
Westinghouse Electric & Mfg. Co.

Electric Cloth Cutter.
Eastman Machine Co.

Electric Fans.
American Blower Co.
Buffalo Forge Co.
Crocker, Wheeler & Co.
General Electric Co.
Mass. Fan Co.
Mechanical Appliance Co.
Philadelphia Drying Machinery Co.
Philadelphia Textile Machinery Co.
Sturtevant, B. F., Co.
Westinghouse Electric & Mfg. Co.

Electric Lamps.
Sturtevant, B. F., Company.

Electric Lighting.
General Electric Co.
Sturtevant, B. F., Company.
Westinghouse Electric & Mfg. Co.

Electric Motors.
Crocker, Wheeler & Co.
General Electric Co.
Mechanical Appliance Co.
Sturtevant, B. F., Company.
Westinghouse Electric & Mfg. Co.

Elevators.
Cohoes Foundry & Machine Co.
Salem Elevator Works.

Embroidery Machines for Hosiery and Knit Goods.
Walther, Otto.

Employees' Time Recorders.
Pettes & Randall Co.

Engravers.
Smith Bros.

Exhaust Heads.
Sturtevant, B. F., Co.

Fans—Exhaust and Ventilating.
——See Ventilating Apparatus.

Fans.
Green Fuel Economizer Co.
Sturtevant, B. F., Co.

Feed Water Heaters.
Green Fuel Economizer Co.
Murray Iron Works Co.
Scaife, W. B. & Sons.

Feed Water Pumps.
Goulds Mfg. Co.
Murray Iron Works Co.
Scaife, W. B. & Sons.

Feed Water Purifiers.
Philadelphia Water Purification Co.

Feeds.
——See Automatic Feeds.

Felt Hardeners.
Farrell Foundry and Machine Co.

Felting Machinery.
Farrell Foundry and Machine Co.

Filters.
Norwood Engineering Co.
Phila. Water Purification Co., The.
Scaife, W. B. & Sons.

Finishing Machinery.
——See Dyeing, Drying, Bleaching and Finishing.

Fire Box Blocks.
McLeod & Henry Co.

Fire Box Blocks, "Steel Mixture."
McLeod & Henry Co.

Fire Brick.
Borgner, Cyrus, Co.
McLeod & Henry.

Fire Extinguishers.
Badger, E. B. & Sons Co.

Fire Hose.
Eureka Fire Hose Co.

Fire Hydrants.
Norwood Engineering Co.

Fire Proof Doors and Windows.
Badger, E. B. & Sons Co.

Fire Pumps.
——See Pumps.
Humphrey Machine Co.

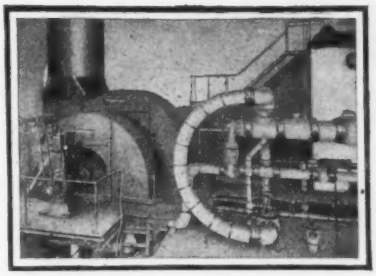
Flax, Tow, Hemp and Jute Machinery.
Fairbairn-Lawson-Combes-Barbour, Ltd.

Fluted Rolls.
Hood, R. H.
Leigh, Evan A.
Riley, C. E. & Co.
Thurston, A. G. & Son.

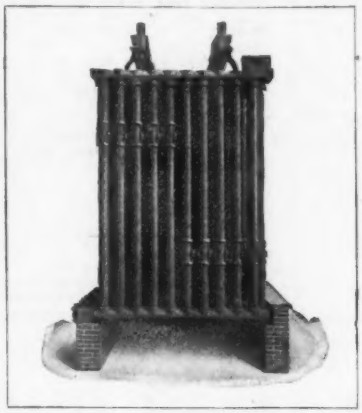
Alphabetical Advertising Index, with page numbers, follows this list.

Mechanical Draft

DOES what an ordinary chimney is incapable of doing. Its cost is from 20 to 40 per cent. of that of a chimney; its intensity permits of the burning of finely divided or low grade fuel; it makes possible the utilization of the heat of the flue gases which a chimney wastes in producing draft; it is independent of the weather; is automatically regulated to maintain constant steam pressure, decreases smoke, increases the capacity of an existing plant, and serves as an auxiliary to a chimney already overburdened; saves space and is portable.



STURTEVANT ECONOMIZERS



will earn 50 per cent. upon the investment.

They will save 10 to 25 per cent. of the fuel.

Increase the boiler capacity 20 to 40 per cent.

Prolong the life and increase the efficiency of the boilers.

Purify the feed water.

Reduce the expense of repairs.

B. F. STURTEVANT CO., BOSTON, MASS.

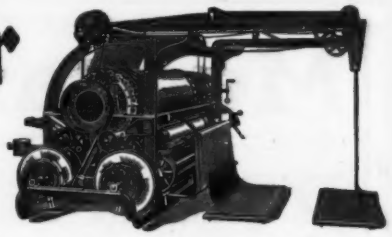
General Office and Works, Hyde Park, Mass.

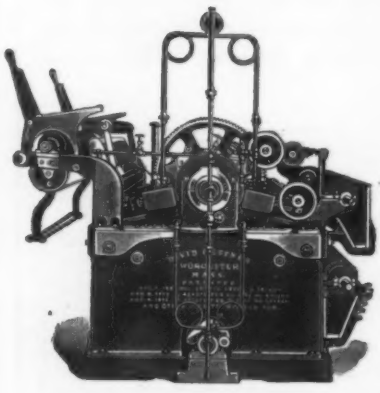
New York Philadelphia Chicago London

413

David Gessner

Worcester, Mass.

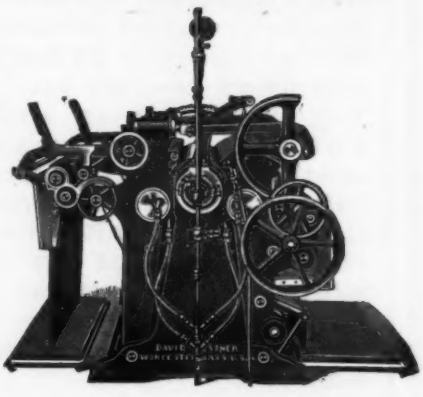




Latest Improved Cloth Finishing Machinery

—

Napping Machines and Presses a Specialty



Flyers.
Hopkins Machine Works.
Leigh, Evan A.

Flyers and Pressers.
Baker Machine Corporation.

Forges.
Buffalo Forge Co.
Sturtevant, B. F., Co.

Forwarders.
McKeon, John F.

Friction Clutches.
—See Clutches.

Friction Cones.
Evans, G. Frank.

Fuel Economizers.
Green Fuel Economizer Co.
Sturtevant, B. F., Co.

Fulling Mills for Woolen Goods.
Hunt, Rodney, Machine Co.
Hopkins Machine Works.
Hunter, Jas., Machine Co.
Kenyon, D. R. & Son.

Garnetts.
Garnett, P. & C., Ltd.
Leigh, Evan A.
Smith & Furbush Machine Co.

Gas Blowers and Exhausters.
Sturtevant, B. F., Co.

Gas Engines.
Jones, Lewis.

Gas Exhausters.
Sturtevant, B. F., Co.

Gauges.
Crosby Steam Gage & Valve Co.
Lunkenheimer Co.
Walworth Manufacturing Co.

Gears.
Farrell Foundry and Machine Co.
New Process Raw Hide Co.

Gear Cutting.
Farrell Foundry and Machine Co.

Gear Cutting Machine.
Whiton, The D. E., Co.

Generating Sets.
Buffalo Forge Co.
Sturtevant, B. F., Co.

Grate Bars.
Tupper, W. W. & Co.

Grease.
Cook's, Adam, Son.

Guides.
Mitchell-Bissell & Co.

Gums.
Standard Starch Co.

Heating.
—See Ventilating.

Heddles.
Steel Heddle Mfg. Co.
Stoddard, Haserick, Richards & Co.

Hoisting Apparatus.
Dodge Coal Storage Co., United Telpherage Dept.
Economy Engineering Co.
Yale & Towne Mfg. Co.

Hosiery Boards.
Pearson, J. T.
Wisconsin Mfg. Co.

Hosiery Labels.
Beck, Charles Paper Co.
Kaumagraph Company.

Humidifying Apparatus.
American Moistening Co.
Bell Pure Air & Cooling Co.
Shutte & Koerting Co.

Hydraulic Rams.
Power Specialty Co.

Hydro Extractors.
American Tool & Machine Co.
Broadbent, Thomas, & Sons.
Riley, C. E. & Co.
Rodney Hunt Machine Co.
Stoddard, Haserick, Richards & Co.
Textile Finishing Machinery Co.
Whiteley, William, & Sons, Ltd.

Injectors.
Lunkenheimer Co.
Schutte & Koerting Co.

Insulating and Braiding Silks.
Sauquoit Silk Mfg. Co.

Ironing Machines for Knit Goods.
Craw, J. W., Laundry Machinery Co.

Iron Work.
Link Belt Engineering Co.

Jacquards.
Halton's, Thomas, Sons.

Knit Goods, Edgings, Trimmings, Etc.
Cathcart, John & Co.
Chapin, Geo. W.
Charles, W. B.
Cheney Bros.
Friedberger-Aaron Mfg. Co.
Hepner & Horwitz.
International Button Co.
Krout & Fite Mfg. Co.
Weimar Bros.

Knit Goods, Finishing Machines, Crochet, Etc.
Craw, J. W., Laundry Machinery Co.
Eastman Machine Co.
Langston, Samuel M.
Merrow Machine Co., The.
Nye & Tredick Co.
Rodney Hunt Machine Co.
Scott & Williams.
Union Special Machine Co.
Willcox & Gibbs Sewing Machine Co.

Knitting Machine Cylinders.
Paxton & O'Neill.
Stafford & Holt.

Knitting Machinery.
Boss Knitting Machine Co.
Brinton, H. & Co.
Claes & Flentje.
Cooper, Chas.
Crane Mfg. Co.
Excelsior Knitting Machine Mfg. Co
Grosser Knitting Machine Co.
Guenther, Max.
Hilscher, G.
Jenckes, E., Mfg. Co.
Jones, Lewis.
Koch, Edward W.
Lamb Knitting Mach. Mfg. Co.
Leighton Machine Co.
Mayo, Geo. D., Knitting Machine Co.
Mayo Knitting Machine & Needle Co.
National Automatic Knitter Co.

Alphabetical Advertising Index, with page numbers, follows this list.

THE NEW
CROMPTON-THAYER LOOM COMPANY
MANUFACTURERS OF
FANCY LOOMS
For Weaving Worsted and Woolen, Fancy Cottons and Silk Fabrics.
DOBBIES, BOX MOTIONS AND SUPPLIES.
Works and Offices: 677 Cambridge Street, Worcester, Mass.
Alexander & Garsed, Southern Agents.

Knitting Machy—cont.
Nye & Tredick Co.
Paxton & O'Neill.
Ruth Machine Co.
Scott & Williams.
Stafford & Holt.
Standard Machine Co.
Taylor, James.
Tompkins Bros.
Walter & Co.
Walther, Otto.
Wildman Mfg. Co.

Knitting Machines.
Gormley, R. W. & Co.

Knitting Needles and Supplies.
Breedon's, Wm., Son.
Brinton, H. & Co.
Continental Latch Needle Company.
Cooper, Chas.
Corey, Wm., Co.
Crane Mfg. Co.
Dodge Needle Co.
Excelsior Needle Co.
Grosser Knitting Machine Co.
Guenther, Max.
Ives, Loyal T.
Kolb, Frank E.
Lamb Knitting Machine Mfg. Co.
Manufacturers' Supplies Co.
Mayo Knitting Machine & Needle Co.
Page Needle Co.
Treat, Orion.
Wardwell Needle Co.

Labeling Machines.
Beck, Chas., Paper Co., Ltd.

Lamps, Incandescent.
General Electric Co.
Sawyer-Mann Electric Co.
Westinghouse Electric & Mfg. Co.

Lathes.
McCabe, J. J.

Leather.
Bowes, L. M., Co.

Loom Pickers.
Garland Mfg. Co.

Loom Repairs and Parts.
Glaser Mfg. Co.

Looms.
Crompton & Knowles Loom Works.
Crompton-Thayer Loom Co.
Draper Company.
Kilburn, Lincoln & Co.
Leigh, Evan A.
Lowell Machine Shop.
Mason Machine Works.
Stafford, G. W., Mfg. Co.
Stoddard, Haserick, Richards & Co.
Whitin Machine Works.

Loopers.
Hepworth, John W. & Co.
Leighton Machine Co.

Lubricators.
Cook's, Adam, Son.
Borne, Scrymser Co.
Dixon, Jos., Crucible Co.
Lunkenheimer Co.

Lug Straps.
Kelley, W. H., & Co.

Lumpers.
Gerry, George & Son.
Schofield, Wm., Co.

Machinery Dealers.
Jefferson, Ed. & Bro.
Lamb, J. K., Textile Mach. Co.
Schofield, Geo. L.
Stead, Arthur.
Taylor, James.

Machinists' Tools.
McCabe, J. J.
Whitin, The D. E. Co.

Mails.
Walder, J.

Measuring and Folding Machines.
Curtis & Marble Machine Co.
Elliott & Hall.
Fabric Measuring & Packaging Co.

Mechanical Draft.
American Blower Co.
Boston Blower Co.
Buffalo Forge Co.
Green Fuel Economizer Co.
Massachusetts Fan Co.
Sturtevant, B. F., Co.

Mechanical Engineers.
American Blower Co.
Buffalo Forge Co.
Dean & Main.
Glaser Mfg. Co.
Murray Iron Works Co.
Philadelphia Drying Machinery Co.
Sturtevant, B. F., Co.
Suck, Adolph.

Mercerizers.
Greenwood & Bault, R.
Home Bleach & Dye Works.
Lorrimer, Wm. H., Sons Co.

Mercerizing Machinery.
Arlington Mch. Wks. (Arthur Birch, prop.)
Butterworth, H. W. & Sons.
Klauder-Weldon Dyeing Machine Co.
Smith, Drum & Co.
Textile Finishing Machinery Co.
Whiteley, William & Sons, Ltd.

Metallic Fire-proof Window Frames and Sashes.
Badger, E. B. & Sons Co.

Metallic Packing.
Power Specialty Co.

Mill Architects.
—See Architects and Mill Engineers.

Mill Brushes.
—See Brushes.

Mill Builders and Engineers.
Ferguson, John W.

Mill Sewing Machines.
—See Sewing Machines and Supplies.

Mill Supplies.
American Supply Co.
Bamford & Smith.
Barker, James.
Buckley's, Benj., Son, Gun Mill.

Alphabetical Advertising Index, with page numbers, follows this list.

TRY IT AT OUR EXPENSE

We are willing to send a "SABLE" Rawhide Belt on a sixty days' trial, and if it is not better than the kind you are now using, it may be returned without one cent of expense to you. We guarantee "SABLE" to transmit 33 per cent. more power and to outlast the best oak tanned belt. Being softer and more pliable, it is especially adapted for use on the pulleys of wood-cutting machines. We make this offer because we know we have the best belt in the world.

Write us at once for Booklet No. 6 and take advantage of our offer.

Shultz Belting Company, St. Louis, Mo.

New York: 111 Chambers St. Boston: 114 High St. Philadelphia: 116 N. Third St.

Mill Supplies—csnt.
Crosby Steam Gage and Valve Co.
Easton-Burnham Co.
Eureka Fire Hose Co.
Garland Mfg. Co.
Glaser Mfg. Co.
Jefferson, Ed. & Bro.
Lane, W. T. & Bro.
Leigh, Evan A.
Main Belting Co.
Morris & Co.
Murphy, E. W. & Co.
Patterson, Gottfried & Hunter, Ltd.
Philadelphia Drying Machinery Co.
Riley, C. E. & Co.
Richardson Bros.
Shaw, Victor, Ring Traveler Co.
Stephenson Mfg. Co.
Stoddard, Haserick, Richards & Co.
Thurston, A. G. & Son.
Tucker, W. W. & C. F.
Turner, J. S., Mfg. Co.
Ward & Vandegrift.
Walworth Manufacturing Co.

Motors.
——See Electric Motors.

Napping Machinery.
American Napping Machine Co.
Borchers, Richard C. & Co.
Curtis & Marble Machine Co.
Gessner, David.
Jones, Lewis.
Leigh, Evan A.
Parks & Woolsen Machinery Co.
Whiteley, William & Sons, Ltd.

Noils (Silk).
Malcolm Mills Co.
Ryle, Wm. & Co.

Office Supplies.
Niagara Clip Co.

Oil Cups.
Lunkenheimer Co.
Tucker, W. & C. F.
Walworth Manufacturing Co.

Oils.
Borne, Scrymser Co.
Cook's, Adam, Son.
Excelsior Wool Compound Co.
Murphy, E. W. & Co.
New York & New Jersey Lubricant Co.
Stephenson Mfg. Co.

Oil Hole Covers.
Tucker, W. W. & C. F.

Oil Purifiers.
Patterson, Gottfried & Hunter, Ltd.

Olive Oil and Olive Oil Foots.
Dewsnap, John B., & Company.

Overhead Tracks.
Cohoes Foundry & Machine Co.

Overseaming Machines.
American Overedging & Seaming Machine Co.
Merrow Machine Co.
Willcox & Gibbs Sewing Machine Co.

Pantagraphs for Mill Engraving.
Johnson, C. A. & Co.

Paper.
Richardson Bros.
Smyth, J. L. N. Paper Co.

Paper Boards.
Shyrock, J. K.
Smyth, J. L. N. Paper Co.

Paper Box Machinery.
Beck, Chas., Paper Co., Ltd.
Langston, Samuel M.

Patent Broker.
Hinckley, F. C.

Patent Solicitors.
Crosby & Gregory.
Howson & Howson.

Perforated Metals.
Beckley, A. J. Co.
Hopkins Machine Works.

Peroxide of Sodium.
Roessler & Hasslacher Chemical Co.

Pipes and Fittings.
Pancoast, Henry B. & Co.
Walworth Manufacturing Co.

Pneumatic Conveying.
——See Ventilating.

Porcelain Guides.
Mitchell-Bissell & Co.

Power Transmission Machinery.
American Drying Machinery Co.
American Mfg. Co.
American Pulley Co.
Cohoes Foundry & Machine Co.
Evans, G. Frank.
Farrell Foundry and Machine Co.
Hunter, Jas., Machine Co.
Jones & Laughlin Steel Co.
Kilburn, Lincoln & Co.
Klein, Chas. C.
Link Belt Engineering Co.
Philadelphia Drying Machinery Co.
Plymouth Cordage Co.
Reeves Pulley Co.
Rodney Hunt Machine Co.
Saginaw Manufacturing Co.
Schofield, Wm., Co.
Sellers, William & Co.
Standard Pressed Steel Co.
Textile Finishing Machinery Co.

Preparatory Machinery (Cotton).
Howard & Bullough Am. Machine Co.
Kitson Machine Co.
Leigh, Evan A.
Riley, C. E. & Co.
Saco & Pettee Machine Shops.

Presses.
Boomer & Boschert Press Co.
Butterworth, H. W. & Sons Co.
Curtis & Marble Machine Co.
Gessner, David.
Hart, Charles.
Murray Iron Works.
North Chelmsford Machine Co.
Spence & Rideout.
Textile Finishing Machinery Co.
Woonsocket Machine & Press Co.

Pressers and Flyers.
Baker Machine Co.

Pressure Regulators.
Crosby Steam Gage & Valve Co.
Mason Regulator Co.
Walworth Mfg. Co.

Pulleys.
——See Power Transmitting Machinery.

Pulley Covering.
Warren Company, The.

Pumps.
Goulds Mfg. Co.
Humphrey Machine Co.
Rodney Hunt Machine Co.
Textile Finishing Machinery Co.

Pump Governors.
Crosby Steam Gage & Valve Co.
Mason Regulator Co.
Walworth Mfg. Co.

Purifying & Filtration Plants.
Norwood Engineering Co.
Philadelphia Water Purification Co.
Scaife, W. B. & Sons.

Quillers.
Foster Machine Co.
North Chelmsford Machine Co.
Payne, G. W. & Co.

Rag Pickers.
Schofield, Wm., Co.
Smith & Furbush Machine Co.

Ramie Tops and Noils.
Tierney, Frank A.

Raw Hide Gears.
New Process Raw Hide Co.

Reed and Harness Manufacturers.
American Supply Co.
Garland Mfg. Co.
Walder, J.

Reels.
North Chelmsford Machine Co.

Reducing Valves.
Crosby Steam Gage & Valve Co.
Mason Regulator Co.
Walworth Mfg. Co.

Regulators (Pressure).
Crosby Steam Gage & Valve Co.
Mason Regulator Co.
Walworth Mfg. Co.

Remnants.
Feingold, H. & D.

Ribbons.
Barton, F. C.
Cheney Bros.

Ring Travelers.
DeHaven Mfg. Co.
Shaw, Victor, Ring Traveler Co.

Roofing.
Lincoln Waterproof Cloth Co.
Standard Paint Co.

Roller Coverers.
Turner, J. S., Mfg. Co.

Roller Leather.
bowes, L. M., Co.
Turner, J. S., Mfg. Co.

Rollers (Rubber).
Boston Belting Co.

Roll Logs.
Hartwell, Geo. E.

Rope.
American Mfg. Co.
Plymouth Cordage Co.

Rope Transmission.
American Mfg. Co.
Plymouth Cordage Co.
Rodney Hunt Machine Co.

Roving Cans.
Hill, James, Mfg. Co.

Ruberoid Roofing.
Standard Paint Co.

Scallop Machines.
Merrow Machine Co.

Schools.
Bradford-Durfee Textile School.
International Text Book Co.
Lowell Textile School.
New Bedford Textile School.
Philadelphia Textile School.

Secondhand Machinery.
——See Mchry. Dealers, also classified Ads.

Screens (Perforated).
——See under Perforated Metal.
——See Commission Merchants.

Separators.
Draper Co., The.

Sewing Machines and Supplies.
American Overedging & Seaming Mch. Co.
Arlington Mch. Wks. (Arthur Birch, prop.)
Bridoux, Chas. H.
Curtis & Marble Machine Co.
Dinsmore Mfg. Co.
Fales, L. F.
Manufacturers' Supplies Co.
Textile Finishing Machinery Co.
Union Special Machine Co.
Walter & Co.
Willcox & Gibbs Sewing Machine Co.

Shafting, Hangers, Etc.
——See Power Transmission Machinery.

Shear Blades.
Heusch, Severin.

Shearing Machinery.
——See Dyeing, Drying, Bleaching and Finishing.

Sheet Metal Work.
Barney Ventilating Fan Works.

Shell Rolls.
Thurston, A. G. & Son.

Shoddies.
——See Wool Shoddies.

Shuttles.
——See Bobbins, Spools, Shuttles, Etc.

Silk Machinery.
Arlington Mch. Wks. (Arthur Birch, prop.)
Butterworth, H. W., Sons Co.
Leigh, Evan A.
Mason Machine Works.
Stoddard, Haserick, Richards & Co.
Textile Finishing Machinery Co.

Silk Mill Supplies.
Hall, I. A. & Co.

Silk Noils.
Fawcett, Hughes.

Singe Plates.
Arlington Mch. Wks. (Arthur Birch, prop.)
Butterworth, H. W., Sons Co.
Rome Metal Co.
Taunton, New Bedford Copper Co.
Textile Finishing Machinery Co.

Alphabetical Advertising Index, with page numbers, follows this list.

RUBEROID ROOFING

(Trade Mark Registered)

STANDARD FOR FOURTEEN YEARS.

The original weather-proof, elastic and acid-resisting roofing. Resists the great heat and the acid-fumes of dye-houses, etc. Highly fire-resisting. Contains no tar. Especially useful on saw-tooth roofs. Outlasts tin and iron. Send for samples and Booklet R.

THE STANDARD PAINT CO., Sole Mfrs.,

In stock in all large cities. **100 William St., New York.**

Singeing Machines.
Arlington Mch. Wks. (Arthur Birch, prop.)
Butterworth, H. W., Sons Co.
Curtis & Marble Machine Co.
Knapp, Charles H.
Leigh, Evan A.
Smith, Drum & Co.
Textile Finishing Machinery Co.

Sizing, Starch and Gums.
Arabol Mfg. Co.
Nicol, J. M. & J. S.
O. K. Soap Co.
Stein, Hirsch & Co.

Skylights.
Bickelhaupt, G., Skylight Works.
Burnham, Hitchings, Pierson Co.
Drouve, G., Co.

Slashers.
Cohoes Foundry & Machine Co.
Leigh, Evan A.
Lowell Machine Shop.
Riley, C. E. & Co.

Soaps.
American Soap & Washoline Co.
Dobbins Soap Mfg. Co.
India Alkali Works.
Nicetown Mfg. Co.
O. K. Soap Co.
Warren Soap Mfg. Co.

Spindles.
Bamford & Smith.
Buckley, Benjamin, Sons, Gun Mill.
Draper Company.
Easton-Burnham Co.
Hopkins Machine Works.
Leigh, Evan A.
Riley, C. E. & Co.
Stoddard, Haserick, Richards & Co.
Ward & Vandegrift.
Whitin Machine Works.

Spindle Tubes.
Bamford & Smith.
Riley, C. E. & Co.
Stoddard, Haserick, Richards & Co.

Spinning Frames.
——See Cotton Machinery.

Spinning Rings.
Draper Company.
Howard & Bullough American Machine Co.
Whitinsville Spinning Ring Co.

Spinning Tubes.
Buckley, Benjamin, Sons.

Spool Machinery.
Defiance Machine Works.

Spools.
——See Bobbins, Spools, Shuttles, Etc.

Spoolers.
Draper Company.
Easton & Burnham Machine Co.
Lindsay, Hyde & Co.
Payne, George W. & Co.

Starch.
Standard Starch Co.

Steam Boilers.
Stirling Co.
Allen, William, Sons Co.
Murray Iron Works Co.
Wickes Bros.

Steam Boiler Insurance.
Casualty Co. of America.
Hartford Steam Boiler Inspection & Insurance Co.

Steam Boxes.
Allen, William, Sons Co.

Steam Engines.
American Blower Co.
Arlington Mch. Wks. (Arthur Birch, prop.)
Buffalo Forge Co.
Fishkill Landing Machine Co.
Harrisburg Foundry & Machine Co.
Hooven (The), Owens & Rentschler Co.
Murray Iron Works Co.
Sturtevant, B. F., Co.
Textile Finishing Machinery Co.

Steam Jacket Kettles.
Badger, E. B. & Sons Co.

Steam Kettles.
Murray Iron Works.

Steam Pumps.
Goulds Manufacturing Co., The.

Steam Specialties.
Butterworth, H. W., Sons Co.
Crosby Steam Gage and Valve Co.
Lunkenheimer Co.
Mason Regulator Co.
Sturtevant, B. F., Co.
Textile Finishing Machinery Co.
Walworth Manufacturing Co.

Steam Traps.
Albany Steam Trap Co.
American Blower Co.
Sturtevant, B. F., Co.

Stone Ware.
Weeks, A. J.

Stop Motion for Looms.
——See Warp Stop Motions.

Stop Motion for Knitting Machines.
Ruth Machine Co.

Superheaters, Duval.
Power Specialty Co.

Tanks, Tubes and Vats.
Caldwell, W. E., Co.
Cypress Lumber Co.
Hall, Amos H., Son & Co.
Hopkins Machine Works.
Lewis, H. F. & Co.
North Chelmsford Machine Co.
Rodney Hunt Machine Co.
Textile Finishing Machinery Co.
Woolford, George, Tank and Vat Mfg. Co.

Tapes, Braids and Edgings.
Barton, F. C.
Cathcart, John & Co.
Chapin, George W.
Friedberger-Aaron Mfg. Co.
Krout & Fite Mfg. Co.
Weimar Bros.

Telephones.
Pettes & Randall Co.

Telpherage System.
Dodge Coal Storage Co., United Telpherage Dept.

Temples.
Draper Co.

Tentering Machines.
——See Dyeing, Bleaching Machinery, Etc.

Tenter Clips.
——See Dyeing, Drying, Bleaching and Finishing Machinery.

Textile Schools.
——See Schools.

Ticketing Machinery.
——See Labeling Machines.

Tiering Machines.
Economy Engineering Co.

Trade Mark Stamps.
Atlas Copper Stamp Works.
Kaumagraph Co.

Trolley Tracks.
Dodge Coal Storage Co., United Telpherage Dept.

Alphabetical Advertising Index, with page numbers, follows this list.

CATCH THE DUST

IN YOUR MILL OR FACTORY BY USING AN

ALLINGTON OR MARSHALL

Dust Collecting System

ALLINGTON & CURTIS MANUFACTURING CO., Saginaw, Mich.

ANALYSES OF WATER, COAL, SIZES, OILS, SOAPS, CHEMICALS AND MILL SUPPLIES GENERALLY.

PRIVATE TELEPHONE EXCHANGE, 2012 MAIN.

LITTLE & WALKER,

CHEMISTS,

93 BROAD ST., BOSTON.

SPECIALISTS IN THE CHEMISTRY OF FIBRES AND TEXTILE PROCESSES.

EXPERTS IN PATENT CAUSES.

REPORTS ON BLEACHING, DYEING AND FINISHING PROCESSES AND PLANTS.

Trucking.
McKeon, John F.
Turbines.
—See Water Wheels.
Twine.
American Mfg. Co.
Plymouth Cordage Co.
Richardson Bros.
Twisting Machinery.
Smith & Furbush Machine Co.
Valves.
Crosby Steam Gage & Valve Co.
Lunkenheimer Co.
Mason Regulator Co.
Schutte & Koerting Co.
Walworth Mfg. Co.
Ventilating Apparatus.
Allington & Curtis Mfg. Co.
American Moistening Co.
American Blower Co.
American Drying Machinery Co.
Barney Ventilating Fan Works.
Bell Pure Air & Cooling Co.
Berry, A. Hun.
Boston Blower Co.
Buffalo Forge Co.
Burnham, Hitchings, Pierson Co.
Drouve, G. Co.
Massachusetts Fan Co.
New York Blower Co.
Philadelphia Drying Machinery Co.
Philadelphia Textile Machinery Co.
Sargent's, C. G., Sons.
Schnitzler, Chas. H.
Sturtevant, B. F., Co.
Warpers.
Draper Company.
Entwistle, T. C. Co.
Warping and Beaming Machinery.
Altemus, J. K.
Borchers, Richard C. & Co.
Draper Company.
Entwistle, T. C., Co.
Smith & Furbush Machine Co.
Whiteley, William, & Sons, Ltd.
Warp Stop Motions.
American Textile Appliances Co.
Coldwell-Gildard Co.
Draper Company.
Warp Tying-in Machinery.
Barber & Coleman Co.
Washers (Cloth).
Arlington Mch. Works (Arthur Birch, prop.)
Birch, Arthur, Arlington Mch. Works.
Butterworth, H. W., & Sons Co.
Hunt, Rodney, Machine Co.
Hunter, Jas., Machine Co.
Kenyon, D. R., & Son.
Philadelphia Drying Machinery Co.
Textile Finishing Machinery Co.
Washing Soda.
Ford, J. B., Co.
Watchman's Clocks.
Nanz & Co.
Pettes & Randall Co.
Water Chemists.
Scaife, W. B. & Sons Co.
Water Purifiers and Filters.
Philadelphia Water Purification Co.
Scaife, W. B., & Sons Co.
Water Softeners.
Ford, J. B., Co.
Philadelphia Water Purification Co.
Scaife, W. B. & Sons Co.
Water Towers.
Caldwell, W. E., Co.
Stevens Tank & Tower Co.
Water Wheels.
Humphrey Machine Co.
Hunt, Rodney, Machine Co.
Leffel, James, & Co.
Risdon-Alcott Turbine Co
Smith, S. Morgan, Co.
Water Wheel Governors.
Cohoes Foundry & Machine Co.
Leffel, James, & Co.
Replogle Governor Works.
Whistles.
Lunkenheimer Co.
Winders.
Altemus, J. K.
Easton & Burnham Machine Co.
Foster Machine Co.
Leigh, Evan A.
Lindsay, Hyde & Co.
Payne, George W., & Co.
Universal Winding Co.
Whiteley, William, & Sons, Ltd.
Winders (Back).
Taylor, James.
Winders (Ball).
North Chelmsford Machine Co.
Winders (Hosiery).
Altemus, Jacob K.
Easton & Burnham Machine Co.
Foster Machine Co.
Leighton Machine Co.
Payne, G. W., & Co.
Universal Winding Co.
Wire Stitching Machines.
Beck, Chas., Paper Co., Ltd.
Wood Pulleys.
Reeves Pulley Co.
Saginaw Manufacturing Co.
Woodworking Machinery.
Defiance Machine Works.
Wool.
Stoddard, Haserick, Richards & Co.
Tierney, Frank A.
Wool Compound.
Excelsior Wool Compound Co.
Wool and Waste Dusters.
Garnett, P. & C., Ltd.
Leigh, Evan A.
Sargent's, C. G., Sons.
Schofield, Wm., Co.
Smith & Furbush Machine Co.
Wool Cleaning Compound.
Ford, J. B., Co.
India Alkali Works.
Wool Combing Machinery.
Crompton & Knowles Loom Works.
Leigh, Evan A.
Riley, C. E., & Co.
Stoddard, Haserick, Richards & Co.
Woolen and Worsted Machinery.
Altemus, Jacob K.
American Drying Machinery Co.
American Tool & Machine Co.
Arlington Mch. Works. (Arthur Birch, prop.
Barker, James.
Garnett, P. & C., Ltd.
Birch, Arthur, Arlington Mch. Works.
Butterworth, H. W., Sons Co.
Crompton & Knowles Loom Works.
Crompton-Thayer Loom Co.
Curtis & Marble Machine Co.
Fales, L. F.
Firth, William, Co.
Gessner, David.
Harwood, Geo. S., & Son.
Hood, R. H.
Hunt, Rodney, Machine Co.
Hunter, Jas., Machine Co.
Jefferson, Ed., & Bro.
Kenyon, D. R., & Son.
Leigh, Evan A.
Philadelphia Drying Machinery Co.
Philadelphia Textile Machinery Co.
Riley, C. E., & Co.
Sargent's, C. G., Sons.
Schofield, Geo. L.
Schofield, William, Co.
Smith & Furbush Machine Co.
Stoddard, Haserick, Richards & Co.
Textile Finishing Machinery Co.
Vacuum Dyeing Machine Co.
Whiteley, William, & Sons, Ltd.
Woonsocket Machine & Press Co.
Wool, Non-shrinking Process for.
Heyer, Charles H.
Wool Oiling Apparatus.
Harwood, Geo S., & Son.
Wool Oils.
Borne, Scrymser Co.
Excelsior Wool Compound Co.
Wool Shoddies.
Riverdale Woolen Co.
Slack, Wm. H. H., & Bro.
Wool Spinning Machinery.
Standard Spinning Machine Co.
Wool Washing, Preparing and Drying Machinery.
American Drying Machinery Co.
Hunter, Jas., Machine Co.
Leigh, Evan A.
Philadelphia Drying Machinery Co.
Philadelphia Textile Machinery Co.
Riley, C. E., & Co.
Rodney Hunt Machine Co.
Sargent's, C. G., Sons.
Smith & Furbush Machine Co.
Stoddard, Haserick, Richards & Co.

YARN, THREADS, ETC.

Banding.
Moore, C., & Co.
Sternberg, Fred, & Co.
Toohey, M. J., & Co.
Cotton Yarns.
American Cotton Yarn Exchange.
Ballou Yarn Co.
Catlin & Co.
Chapin, Geo. W.
Charles, W. B.
Daly, James E.
Dana Warp Mills.
Eddy & Street.
Grant Yarn Co.
Greene & Daniels Mfg. Co.
Harding, Whitman & Co.
Indian Orchard Co.
Jenckes Spinning Co.
Lorimer, E. D.
Mitchell, Jas. E., & Co.
Moeller & Littauer.
Montgomery, J. R., Co.
Monument Mills.
New England Cotton Yarn Co.
Orswell Mills.
Paulson, Linkroom Co.
Salkeld, A. D., & Bro.
Sternberg, Fred, & Co.
Strouse, Theo. H., & Co.
Flax, Hemp, Jute and Ramie.
Fawcett, Hughes.
Moeller & Littauer.
Sternberg, Fred, & Co.
Tierney, F. A.
Gassed Yarns.
Ballou Yarn Co.
Greene & Daniels Mfg. Co.
Harding, Whitman & Co.
Lorimer, E. D.
Moeller & Littauer.
New England Cotton Yarn Co.
Sternberg, Fred, & Co.
Glazed Yarns.
Ballou Yarn Co.
Chapin, Geo. W.

Alphabetical Advertising Index, with page numbers, follows this list.

Glazed Yarns—cont.
Harding, Whitman & Co.
Indian Orchard Co.
Lorimer's, Wm. H., & Sons Co.
Malcolm Mills Co.
Moeller & Littauer.
New England Cotton Yarn Co.
Orswell Mills.
Salkeld, A. D., & Bro.
Skerry, A. T., & Co.
Sternberg, Fred, & Co.
Strouse, Theo. H., & Co.
Walcott & Campbell Spinning Co., New York Mills.

Harness Twine.
Ballou Yarn Co.
Cranston Worsted Mills.
Fawcett, Hughes.
Moore, C., & Co.
Sternberg, Fred, & Co.

Hosiery and Knitting Yarns.
Boyer, B. F., Co.
Cranston Worsted Mills.
Chapin, George W.
Daly, James E.
Greene & Daniels Mfg. Co.
Harding, Whitman & Co.
Hyde, E. S.
Jenckes Spinning Co.
Mitchell, James E., & Co.
Moeller & Littauer.
Monument Mills.
New England Cotton Yarn Co.
Queensbury Mills.
Skerry, A. T., & Co.
Sternberg, Fred, & Co.

Knitting Yarns.
Daly, James E.

Mercerized Yarns.
Daly, James E.
Harding, Whitman & Co.
Harper, E. G.
Indian Orchard Co.
Lorimer, E. D.
Lorimer, Wm. H., & Sons Co.
Moeller & Littauer.
Montgomery, J. R., & Co.
New England Cotton Yarn Co.
Sternberg, Fred, & Co.
Strouse, Theo. H., & Co.

Mohair Yarns.
Cranston Worsted Mills.
Daly, James E.
Harding, Whitman & Co.
Moeller & Littauer.
Montgomery, J. R., & Co.

Novelty Yarns.
De Veer, H.
New England Cotton Yarn Co.

Novelty Yarns, Tinsels, Silk Noils, Etc.
Cranston Worsted Mills.
Daly, James E.
Indian Orchard Co.
Jenckes Spinning Co.
Malcolm Mills Co.
Moeller & Littauer.
Montgomery, J. R., & Co.
Skerry, A. T., & Co.
Sternberg, Fred, & Co.

Stoddard

We import a most complete and extensive line of **Cotton, Silk, Worsted, Woolen and Fibre Machinery, Mill Supplies, Egyptian Cotton and Burlaps.** Representing the

Haserick

leading foreign manufacturers and dealers and keep thoroughly up with the latest inprovements in Textile Machines. We should be pleased to com-

Richards

municate with parties contemplating any additions or changes in mill equipments and to send circulars describing at length, our machines and supplies.

& Co.

152-8 CONGRESS STREET, BOSTON
8 CURRER STREET, BRADFORD, ENG.
PHILADELPHIA OFFICE, BOURSE BLDG.
EAST FOURTH STREET, CHARLOTTE, N. C.

Silk Noils.
Daly, James E.
De Veer, H.
Tierney, F. A.

Silk Yarns.
Chapin, Geo. W.
Cheney Bros.
Daly, James E.
De Veer, H.
Eddy & Street.
Ryle, Wm., & Co.
Sauquoit Silk Mfg. Co.

Tinsels.
Daly, James E.
De Veer, H.

Tussah Waste.
Daly, James E.
De Veer, H.

Woolen and Merino Yarns.
Boyer, B. F., Co.
Daly, James E.
Eaton Rapids Woolen Mills.
Eddy & Street.
Hyde, E. S.
Jenckes Spinning Co.
Moeller & Littauer.
Salkeld, A. D., & Bro.
Skerry, A. T., & Co.
Solis, Andrew J., Jr., & Co.
Speed & Stephenson.

Woolen Yarns.
Adams, Joseph M., Co.
Moeller & Littauer.

Worsted Yarns.
Boyer, B. F., Co.
Campion, Richard.
Cranston Worsted Mills.
Harding, Whitman & Co.
Moeller & Littauer.
Pocasset Worsted Co.
Queensbury Mills.
Salkeld, A. D., & Bro.
Skerry, A. T., & Co.
Speed & Stephenson.

Alphabetical Advertising Index, with page numbers, follows this list.

PRELIMINARY to the organization of THE STIRLING CONSOLIDATED BOILER CO., which is about to be formed to succeed to and acquire the water tube boiler business and plants of

THE STIRLING COMPANY, Barberton, Ohio

AND

THE AULTMAN & TAYLOR MACHINERY CO., Mansfield, Ohio,

The Stirling Company begs to announce that it has acquired the plant of The Aultman & Taylor Machinery Co., and all unfilled orders and contracts for boilers. Inquiries for Water Tube Boilers of the Stirling & Cahall horizontal types are respectfully solicited.

The effort of THE STIRLING CONSOLIDATED BOILER CO. will be to supply the trade with whatever type may be required by it, in accordance with the most advanced practice, and most improved and well-tested designs.

THE STIRLING COMPANY,

Works
BARBERTON, O.
MANSFIELD, O.

General Offices
111 Broadway, NEW YORK.

Alphabetical Index to Advertisements.

Adams, Joseph M., Co. 245
Aiton Machine Co. 20
Albany Steam Trap Co. 47
Allen Sons Co., Wm. 265
Allington & Curtis 215
Altemus, Jacob K. 15
American Blower Co. 287
American Chemical Co. 260
Am. Cotton Yarn Exchange 241
American Dyeing Machine Co. .. 39
American Dyewood Co. ..... —
Am. Drying Machine Co. 20
American Mfg. Co. 63
American Moistening Co. 31
American Napping Mach. Co. Outside Back Cover
American Overedging and Seaming Machine Co. 282
American Pulley Co., The 26
Am. Soap & Washoline Co. 259
American Supply Co. 36
American Textile Appliances Co. 10
American Textile Specialty Machinery Co. 48-49
Am. Tool & Machine Co. 57
Arabol Mfg. Co., The 265
Arlington Machine Works 37
Ashworth Bros. 36
Atlas Copper Stamp Works 45
Atteaux, F. E., & Co. 259
Badger, E. B., & Sons Co. 57
Badger Fire Extinguisher Co. .. 57
Bailey, Frank 38
Baker Machine Co. 30
Ballinger & Perrot 222
Ballou Yarn Co. 241
Bamford & Smith 52
Barker, James ..... —
Barney Ventilating Fan Works 21
Barrett Mfg. Co. 262
Barton, F. C. 241
Beckley, A. J. 287
Beck Paper Co., Chas. 283
Bell Pure Air & Cooling Co. 35
Berlin Aniline Works 260
Berry, A. Hun 47
Bickelhaupt, G., Skylight Works 285
Birch, Arthur 37
Birdsboro Steel Foundry & Machine Co. 27
Bischoff, C., & Co. 263
Blaisdell, Jr., Co., The S. 246
Boomer & Boschert Press Co. .. 236
Borchers, Richard C., & Co. 56
Borgner, Cyrus, Co. 262
Borne Scrymser Co. 44
Boss Knitting Machine Works .. 278
Bosson & Lane 258
Boston & Albany R. R. 252
Boston Belting Co. 17
Boston Blower Co. 286
Bowes, The L. M. Co. 50
Boyer, B. F. Co. 242
Breedon's Son, Wm. 284
Bridoux, Chas. H. 285
Brinton, H., & Co. 273
Broadbent, Thomas, & Sons 207
Brophy, T., Sons 254
Brown, W. H. 40
Buckley's, Benj., Son 43
Buffalo Forge Co. Outside Back Cover
Bull, William C. 277
Burkhard, Thomas 46
Burnham, Hitchings, Pierson Co. 59
Butterworth, H. W., & Sons Co. 1
Butterick Pub. Co. Inside Back Cover
Caldwell, W. E., Co. 260
Cameron, James A. 253
Campion, Richard 242
Cannon Mills 238
Cassella Color Company 261
Casualty Co. of America 248
Cathcart, John, & Co. 241
Cathrall 223
Catlin & Co. 239
Chaffee Brothers Company 37
Chapin, Geo. W. 244
Charles, William B. 245-247
Cheney Bros. 244
Claes & Flentje 278-283
Cling Surface Mfg. Co. 208
Cohoes Foundry & Mch. Co. 236
Coldwell-Gildard Co. 223
Continental Latch Needle Co. .. 284
Cook's Sons, Adam 34
Cooper, Chas. 270
Corey, Wm., Co. 284
Crane Mfg. Co. 278
Cranston Worsted Mills 242
Craw, J. W., Laundry Mchy. Co. 280
Crocker-Wheeler Co. 51
Crompton & Knowles Loom Works 66
Crompton & Thayer Co. 213
Crosby & Gregory 223
Crosby Steam Gauge & Valve Mfg. Co. 226
Curtis & Marble Machine Co. ... 33
Cypress Lumber Co. 262
Daly, James E. 246
Dana Warp Mills 238
Davenport Pearl Button Co. 283
Davidson, J. F. 254
Dean, John M. 33
Dean & Main 222
Defiance Machine Works 34
De Haven Mfg. Co. 236
de Veer, H. 246
Dewsnap, John B., & Co. 36
Dinsmore Mfg. Co. 56
Dixon, Jos., Crucible Co. 40
Dobbins Soap Mfg. Co. 40
Dodge Coal Storage Co. 50
Dodge Needle Co. 284
Draper Company 3
Drouve, The G., Co. 283
Eastman Machine Co. 283
Easton-Burnham Co. 29-58
Eaton Rapids Woolen Mills 242
Economy Engineering Co. 53
Eddy & Street 242
Elliot & Hall 47
Entwistle, T. C., Co. 33
Eureka Fire Hose Co. 57
Evans, G. Frank 30
Excelsior Knitting Machine Mfg. Co. 276
Excelsior Needle Co. 284
Excelsior Wool Oil Compound Co. 50
Fabric Measuring & Packaging Co. 26
Fairbairn - Lawson-Combs-Barbour, Ltd. 13
Fairhill Bleachery 255
Fales, L. F. 32
Farbenfabriken of Elberfeld Company 259
Farrell Foundry & Machine Co. 61
Fawcett, Hughes 241
Fawell, Arthur 260
Feingold, H. & D. 220
Felton, S. A., & Son Co. 16
Ferguson, John W. 222
Ferrofix Brazing Co. 225
Firth & Foster Co. 255
Firth, William, Co. 30
Fishkill Landing Machine Co. .. 41
Ford, J. B., Co. 234
Foster Machine Co. Outside Back Cover
Friedberger-Aaron Mfg. Co. 269
Fries, John W. 53
Frisco System 252
Garland Mfg. Co. 36
Garnett, P. & C., Ltd. 22
Geigy Aniline & Extract Co. 260
Geisenheimer & Co. 250
General Electric Co. 54
Gerry, Geo., & Son 264
Gessner, David 212
Glaser Mfg. Co. 225
Gormly, Robert W., & Co. 282
Goulds Mfg. Co. 52
Grant Yarn Co. 240
Green Fuel Economizer Co. 27
Greene & Daniels Mfg. Co. 238
Greenwood, R., & Bault 254
Grosser Knitting Machine Co. .. 275
Guenther, Max 271
Haedrich, E. M. 260
Hall, Amos H., Son & Co. 265
Hall, I. A., & Co. 47
Halton's, Thomas, Sons 32
Harding, Whitman & Co. 239
Harper Mfg. Co. 38
Harrisburg Foundry & Mach. Works 222
Hart, Charles 33
Harwood, Geo. S., & Son 21
Hartford Steam Boiler Inspection & Insurance Co. 32
Hartwell, Geo. E. 260
Heathcote, John, & Son 38
Hepner & Horwitz 241
Hepworth, John W., & Co. 280
Heusch, Severin 40
Heyer, Charles H. 235
Hill, James Mfg. Co. 30
Hilscher, G. 277
Hinckley, F. C. 223
Hoffman, DeWitt & McDonough 246
Home Bleach & Dye Works 255
Hood, R. H. 33
Hooven, Owens & Rentschler Co. 53
Hopkins Machine Works 35
Howard & Bullough Am. Machine Co. 68
Howson & Howson 223
Humphrey Machine Co. 41
Hunt, Rodney, Machine Co. 24
Hunter, Jas., Machine Co. 25
Hyde, Edward S. 245
India Alkali Works 285
Indian Orchard Co. 240
Ingrahamville Dye Works 254
International Button Co. 283
International Correspondence Schools 231
Ives, Loval T. 284
Jefferson, Edw., & Bro. 224
Jenckes, E., Mfg. Co. 272
Jenckes Spinning Co. 240
Johnson, Chas. A., & Co. 59
Jones, Lewis 278
Jones & Laughlin Steel Co. 55
Kaile & Co. 263
Kelley, W. H., & Co. 51
Kaumagraph Company 52
Kenyon, D. R., & Son 23
Kilburn, Lincoln & Co. 43
Kitson Machine Co. 7
Klauder-Weldon Dyeing Machine Co., The 19
Klein, Chas. C. 46
Klipstein, A., & Co. 39-257
Knapp, Chas. H. 42
Koch, Edward W. 277
Krout & Fite Mfg. Co. 242
Kuttroff, Pickhardt & Co. 64
Lamb Knitting Machine Co. 279
Lamb, J. K., Textile Mach. Co. —
Lane, W. T., & Bro. 40
Langston, Samuel M. 281
Leffel, James, & Co. 286
Leigh, Evan Arthur 11
Leighton Mch. Co. 276
Lewis, H. F., & Co., Ltd. 46
Leyland, Thomas, & Co. 61
Lincoln Waterproof Cloth Co. .. 40
Lindsay Hyde & Co. 223
Link-Belt Engineering Co. 41
Little & Walker 216
Lorimer, E. D., & Co. 239

Lorimer's, Wm. H., Sons Co. ... 254
Lowe, S. C. ... 9
Lowell Crayon Co. ... 285
Lowell Machine Shop ... 2
Lowell Textile School ... —
Lunkenheimer Co., The ... 208
Main Belting Co. ... 46
Malcolm Mills Co. ... 242
Manufacturers' Supplies Co. ... 284
Maryland Bleach & Dye Works 255
Mason Brush Works ... 57
Mason Machine Works ... 12
Mason Regulator Co. ... 51
Massachusetts Fan Co. ... 285
Mayo Knitting Machine & Needle Co. ... 273
Mayo, Geo. D., Machine Co. ... 268
McCabe, J. J. ... 258
McKeon, John F. ... 220
McLeod & Henry Co. ... 18
Mechanical Appliance Co. ... 16
Merrow Machine Co. ... 272
Metallic Drawing Roll Co. ... 33
Metz, H. A., & Co. ... 258
Mitchell-Bissell Co. ... 235
Mitchell, Jas. E., & Co. ... 239
Moeller & Littauer ... 239
Montgomery, J. R., Co. ... 238
Monument Mills ... 238
Moore, C., & Co. ... 245
Morris & Co. ... 41
Murphy, E. W., & Co. ... 46
Murray Iron Works Co. ... 221
Nanz & Co. ... 46
National Automatic Knitter Co. 282
New Bedford Textile School ... 252
New England Butt Co. ... 43
New England Cotton Yarn Co. .. 240
New York Blower Co. ... 222
New York & New Jersey Lubricant Co. ... 245
New Process Rawhide Co. ... 44
Niagara Clip Co. ... 37
Nicetown Mfg. Co. ... 275
Nicol, J. M. & J. S. ... 265
North Chelmsford Machine Co... 56
Norwood Engineering Co. ... 264
Nye & Tredick Company ... 268
Orswell Mills ... 240
Page Needle Co. ... 284
Pancoast, Henry B., & Co. ... 18
Parks & Woolson Mch. Co. ... 14
Patterson, Gottfried & Hunter, Ltd. ... 58
Paulson, Linkroum & Co. ... 239
Pawtucket Dyeing & Bleaching Co. ... 255
Paxton & O'Neill ... 280
Payne, Geo. W., & Co. ... 277
Pearson, J. T. ... 280
Peerless Company, The ... 255
Pettes & Randall Co. ... 246
Philadelphia Drying Mchy. Co... 13
Philadelphia Textile Mchy. Co... 288
Philadelphia Textile School ... 252
Phila. Water Purification Co. ... 44
Phoenix Iron Works Corp. ... 39
Plymouth Cordage Co. ... 251
Pocasset Worsted Co. ... 242
Power Specialty Co. ... 253
Providence Machine Co. ... 16
Providence Mills Company ... 254
Quaker City Knitting Co. ... 275
Queensbury Mills ... 243
Reeves Pulley Co. ... 43
Replogle Governor Works, The.. 287
Richardson Bros. ... 255
Riley, C. E., & Co. ... 207
Risdon-Alcott Turbine Co. ... 286
Riverdale Woolen Co. ... 247
Rock Island System ... 60
Roessler & Hassiacher Chemical Co. ... 261
Rome Metal Co. ... 262
Rowland, Samuel ... 254
Ruth Machine Co. ... 281
Ryle, William, & Co. ... 244
Saco & Pettee Machine Shops .. 5
Saginaw Mfg. Co. ... 43
Salem Elevator Works ... 42
Salkeld, A. D., & Bro. ... 239
Sargent's, C. G. Sons ... 22
Sauquoit Silk Mfg. Co. ... 244
Scaife, W. B., & Sons ... 59
Schnitzler, Chas. H. ... 287
Schofield, Geo. L. ... 222
Schofield, William, Co. ... 46
Schutte & Koerting Co. ... 52
Scott & Williams ... 8
Sellers, Wm., & Co. ... 42
Shaw, Victor, Ring Traveler Co. 37
Shryock, J. K. ... 38
Shultz Belting Co. ... 213
Simpson Bros. Corporation ... 59
Slack, Wm. H. H., & Bro. ... 247
Smith Brothers ... 53
Smith, Drum & Co. ... —
Smith, S. Morgan, Co. ... 287
Smith & Furbush Machine Co. .. 288
Smythe, J. L. N., Co. ... 36
Solis, Andrew J., Jr., & Co. ... 246
Solvay Process Co. ... 262
Speed & Stephenson ... 222
Spence & Rideout ... 283
Stafford, Geo. W., Co. ... 4
Stafford & Holt ... 274
Standard Machine Co. ... 281
Standard Paint Co. ... 215
Standard Pressed Steel Co. ... 59
Standard Starch Co. ... 250
Stead, Arthur ... 222
Steel Heddle Mfg. Co. ... 46
Stein, Hirsch & Co. ... 265
Stephenson Mfg. Co. ... 47
Sternberg, Fred, & Co. ... 239
Stirling Company, The ... 218
Stoddard, Haserick, Richards & Co. ... 217
Strouse, Theo. H., & Co. ... 241
Sturtevant, B. F., Co. ... 211
Suck, Adolph ... 222
Sykes, Walter F., & Co. ... 263
Taunton-New Bedford Copper Co. ... 262
Taylor, Jas. ... 274
Tebbetts, E. L., & Co. ... 36
Textile Finishing Machinery Co. Inside Front Cover
Textile Machine Works ... 36
Thayer, Edward M., & Co. ... 260
Thompson-Bonney Co. ... 225
Thurston, A. G., & Son ... 43
Tierney, Frank A. ... 235
Tompkins Bros. ... 282
Toohey, M. J., & Co. ... 238
Torrance Mfg. Co. ... 32
Treat, Orion ... 284
Tucker, W. & C. F. ... 22
Tupper, W. W., & Co. ... 59
Turner, J. S., Mfg. Co. ... —
Underfeed Stoker Co. ... 287
Union Special Machine Co. ... 279
Universal Winding Co. ... 232
Vacuum Dyeing Mch. Co. ... 19
Vacuum Process Co. ... 53
Vila, H. S. ... 265
Walcott & Campbell Spinning Co. ... 238
Walder, J. ... 37
Walter & Co. ... 285
Walther, Otto ... 267
Walworth Manufacturing Co. Outside Back Cover
Ward & Vandergrift ... 36
Wardwell Needle Co. ... 284
Warren Co. ... 246
Warren Soap Mfg. Co. ... 37
Weeks, A. J. ... 57
Weimar Bros. ... 284
Western Textile Fibre Co. ... 255
West Indies Chemical Works, Ltd. ... 265
Westinghouse Electric & Mfg. Co. ... 221
Whiteley, Wm., & Sons, Ltd. ... 14
Whitin Machine Works ... 6
Whitinsville Spinning Ring Co... 37
Whiton, D. E., Machine Co. ... 34
Wickes Brothers ... 47
Wildman Mfg. Co. ... 266
Willcox & Gibbs Sewing Machine Co. ... 255
Wisconsin Mfg. Co. ... 275
Wolfenden, C. ... 224
Woolford, G., Wood Tank Mfg. Co. ... 264
Woonsocket Mach. & Press Co... 28
Vagi & Merrill ... 222
Yale & Towne Mfg. Co. ... 51

JOHN F. McKEON,
Manufacturers' Forwarding Agent
SALVATOR TRANSFER
370 & 372 Washington St.,
Telephone Connection. NEW YORK.

Manufacturers shipping goods to, from or through New York may be sure of careful and intelligent attention to every detail. We handle the business of many large textile concerns.

A Quick Turn-over

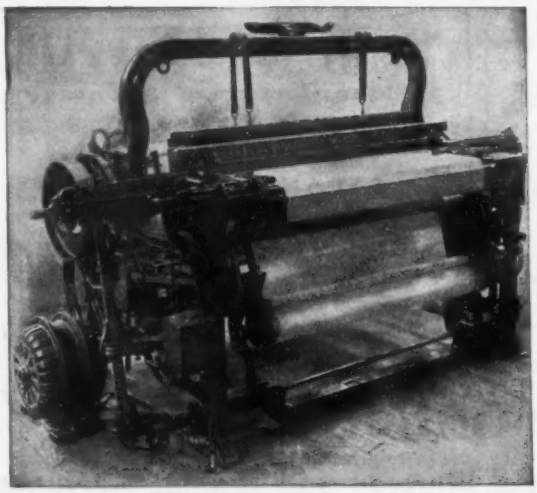
We are not acrobats, but we ARE adepts in turning textile goods of all kinds into cash. Send samples and state quantity.

H. & D.
FEINGOLD
91 BEDFORD ST.
BOSTON, MASS.

Westinghouse Induction Motors

Are peculiarly adapted to meet the most exacting requirements of cotton mills; they

Increase Production---Decrease Costs.



The illustration shows a Stafford 1905 Model Cotton Loom direct driven by a Westinghouse Induction Motor without any intermediate clutch or starting device.

Looms direct driven by Westinghouse Motors have a steadier speed, give an increased and better quality of product, and all the annoyances and expense of shafting, pulleys and belting are eliminated.

Some of our engineers have made a special study as to the motor requirements of cotton and other textile mills, and we are always ready to give prospective customers and their engineers the benefit of our large experience in this line.

Westinghouse Electric & Mfg. Co.,

Pittsburg, Pa.

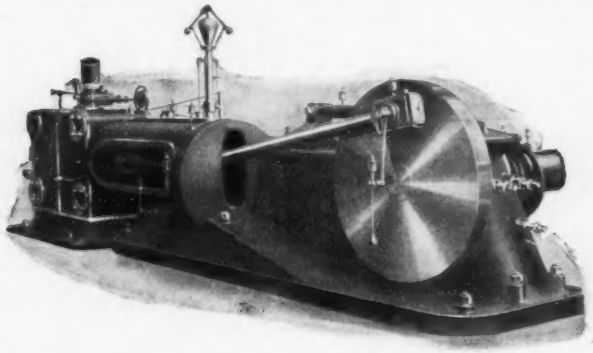
Sales Offices in All Large Cities.

For Canada: Canadian Westinghouse Co., Ltd., Hamilton, Ontario.

Murray Corliss Engines Save Steam

Steam is Coal and Coal is Cash

A mill or lighting plant not now profitable can often be put on a dividend basis by improving its power plant. We will do the business, furnishing engines, boilers, and heaters—all built by us



MURRAY IRON WORKS COMPANY

INCORPORATED FEB'Y 1, 1870

BURLINGTON, IOWA. (Right in the Middle of the U. S.)

We serve the entire country **Catalogue 71 ready for buyers**

Engine on exhibition and office in The Bourse, Philadelphia

Plans, Specifications and Superintendence for the Construction or Reorganization of Textile Plants, including Steam and Water Power.

DEAN & MAIN,
Mill Engineers and Architects,
1112 EXCHANGE BUILDING, 53 STATE STREET,
BOSTON, MASS.

Valuations and Reports of Plants for Sale, Rental, Taxes or Insurance.

BALLINGER & PERROT,
Successors to HALES & BALLINGER.
ARCHITECTS AND MILL ENGINEERS,
Southwest Corner Twelfth and Chestnut Sts.,
Telephone No. 2552. PHILADELPHIA.

ADOLPH SUCK
Mill Architect and Engineer
179 SUMMER ST., BOSTON, MASS.

JOHN W. FERGUSON,
Builder and
General Contractor.
MILL BUILDING A SPECIALTY. References made to some of the largest mill owners in the Middle States, including Clark thread Co., Newark, N. J., Barbour Flax Spinning Co., Paterson, N. J., and others.
253 Broadway, N. Y. 90 Washington St., Paterson, N. J.

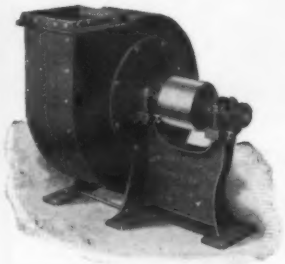
Harrisburg, Pa.
An Ideal Shipping Point
Have you ever experienced the need of a central distributing point for the eastern field? Many manufacturers now carry stocks of goods here. The best located man often gets the trade. You can RENT Large, Centrally Located Warehouses with attendants, of us, or you can BUY our former plant (we now occupy our new factory), well located for manufacturing or warehouse purposes.
Harrisburg Foundry and Machine Works

Yagi & Merrill,
Manufacturers' Agents.
General import and export business between
The UNITED STATES,
JAPAN and CHINA.
Special attention given to COTTON FABRICS and to COTTON MILL MACHINERY.
OFFICES:
396-398 Broadway, New York City.
6 Teapo Street, Nagoya, Japan.

Speed & Stephenson,
170 SUMMER STREET, BOSTON.
IMPORTERS AND DEALERS IN
NEW AND SECOND-HAND
Worsted and Woolen Machinery
A Large Supply of Worsted Machinery Always on Hand.

ARTHUR STEAD
DEALER IN
Woolen and Worsted Machinery
ALL SUPPLIES
227 Chestnut Street, PHILADELPHIA
Send for list and state what is wanted.

NEW AND SECOND-HAND
WOOLEN
Machinery
GEO. L. SCHOFIELD, 123 No. Front St., PHILA., PA.
Agent for the Weston Hydro Extractor.



Our Reversible Fans with
One-Piece Fan Wheels
will handle any stringy material as well as dust.
They are efficient and lasting, run steady and cool.
Write for Circular M-1.
THE NEW YORK BLOWER COMP'Y,
149 Broadway, New York. 25th Place & Stewart Ave., Chicago.
Factory, Bucyrus, O. Sydnor Pump & Well Co., Richmond, Va.

PATENTS CROSBY & GREGORY,

GEO. W. GREGORY. JOHN C. EDWARDS.

Old South Building, Washington St., Boston.

Telephone, Main 3593, Boston. **Office Established 1854.** Cable Address, "Aniline."

Patents secured in the United States and all other countries. Reissues obtained. Interferences conducted. Suits brought and defended for infringements, and searches made as to the validity of patents. Prepared to give special and expert attention to cases involving knowledge of cotton, wool, leather and metal working machinery, including boots and shoes and electrical, chemical and metallurgical inventions and steam engineering. We have had wide experience in textile patents cases. Correspondence solicited. No charge for preliminary advice. Personal consultation best when possible.

Textile Patents
SOLD IN EUROPE

Correspond with

F. C. HINCKLEY, Patent Broker,
143 Liberty Street, NEW YORK.

Reels for Cotton WOOLEN AND WORSTED

Patented Hosiery Winders, Cop Winders and Spoolers.

LINDSAY, HYDE & CO.,
2134 to 2130 East York St., PHILADELPHIA, PA.

Counselors at Law
HOWSON & HOWSON
Solicitors of Patents

PHILADELPHIA, West End Building,
32 South Broad Street
NEW YORK, 38 Park Row
WASHINGTON, 918 F Street

Have Your Accounts Financed.

Consult—

CATHRALL,
513 Drexel Building,
Bell 'Phone — Market 3116 **PHILADELPHIA, PA.**

THE
"C. & G." Warp Stop-Motion.

ABSOLUTELY THE BEST.

UNIVERSAL, DURABLE, SIMPLE, EFFICIENT.

PRACTICALLY INDESTRUCTIBLE.
FIRST COST THE ONLY COST.

THE COLDWELL-GILDARD CO.
108-110 Hartwell Street, Fall River.

WANTS, FOR SALE, ETC.

Rates, 15 cents a line per issue when replies are sent in care of TEXTILE WORLD RECORD to be forwarded. If replies go direct to advertiser the rate is 10 cents per line per issue. Count seven words to a line and include side head and address. Cash must accompany the order for these ads. If such ads. are "displayed" the rate is $2.00 per inch single column each time.

Superintendent Wanted

For knitting mill, making worsted and woolen sweaters, tam o'shanters, and toques.

Must be familiar with all kinds of flat and circular knitting machines. An A. No. 1 man. Capable manager with highest references. Satisfactory arrangements made with the right man.

QUAKER CITY KNITTING CO.,
240 Chestnut St., Philadelphia, Pa.

Woolen Mill at Public Sale

to close a trust.

The Fort Casimir Woolen Mills at New Castle, Del.,

will be offered at Public Sale on the premises at New Castle, Del., on

TUESDAY, OCTOBER 24th, at 2.30 P. M.

The entire plant, comprising three substantial brick buildings. No. 1 Main Building, 300 ft. long, 47 ft. wide. No. 2 Building, 128 ft. long, 32 ft. wide. No. 3 Building, 94 ft. long, 53 ft. wide. Improved machinery, up-to-date, and can be put in operation in a few days. Two sets boilers, 2 Corliss Engines, 75 h.p. each, Carbonizing Plant, Complete Automatic Sprinkler System. For further information, apply to

The Equitable Guarantee and Trust Company, Trustee, Wilmington, Delaware.

WOOLEN MILL FOR SALE

In flourishing Ohio city. Fully equipped for making Blankets. Also machinery for making Cassimeres, etc. Land, substantial Brick Buildings and Machinery. Address **BLANKET MILL,** Textile World Record, Boston, Mass.

CANADA.

Sewing Machine and Spring Knitting Needles.

Canada is increasing in population and business as never before. The Needle Trade ought to present good openings. **Competent Needle Makers with means** can learn of splendid chance in this line by writing to "Canada," care Textile World Record, Boston, Mass.

C. WOLFENDEN

2316 North 2d Street, Philadelphia, Pa.

Dealer and Jobber in

TEXTILE MACHINERY, NEW AND SECOND HAND

Will buy ODD LOTS OF YARN of any kind. Send Samples and Prices.

FOR SALE.—Canvas Belt about 160 ft. long, 26 in. wide, 3-4 in. thick. In good condition. One 120 in. Beaming Frame. One 20 gauge Flat Top Hand Knitting Machine with two sections, 20 in. each, with swing carrier and narrowing machine. Built for Athletic Knit Goods.

Edward Jefferson & Brother,

Worsted Machinery

127 South 2d St., PHILADELPHIA, PA.

SOLE AGENTS FOR

J. B. FARRAR & SONS, Halifax, England.

TAYLOR, WORDSWORTH & CO., Leeds, England.

FOR SALE.

6 Sett Woolen Mill in Mass. About 10 acres land, substantial Main Building, 3-story Store House, Machine-shop fully equipped, Water Power, 112 H. P., New Dam, New Flume. This must be sold to close an estate and **a big bargain will be given a quick buyer.** Address "Estate," care of Textile World Record, Boston, Mass.

HOSIERY MACHINERY FOR SALE.

1 Dennis 15 Plate (32x41 in.) Steam Press with countershaft. 7 Scott & Williams Ribbers. 3 Branson Ribbers. 66 Branson 2 cylinder Knitters. 36 Excelsior 2 cylinder Knitters. 30 Brinton 2 cylinder Knitters. 18 Scott & Williams 2 cylinder Knitters.

The factory occupied by the above machinery has been sold for a silk mill, and these machines will be sold practically regardless of value. For farther particulars address

CRANE BROTHERS, - - Tobyhanna, Pa.

TO MANUFACTURERS OF KNITTED SWEATERS AND SIMILAR GOODS.

No more attractive, up-to-date, serviceable and easy to knit line has ever been made than our latest discovery in knitted patterns and colorings in great variety, resembling woven tweeds and mingled colored cloth. Knit on almost plain flat machines; novel and permanent value. We wish to introduce this kind of work and the principle of making to manufacturers. Address "Invention," care of Textile World Record, Boston, Mass.

WANTED

Two (2) Iron and two (2) Copper OBERMAYER Dyeing Machines, in good condition. Address "MANUFACTURER," care Textile World Record, Boston.

HERE IS A RARE OPPORTUNITY

for some one among the cotton mills of the South.

For Sale! A complete plant for the manufacture of cop tubes. Can be seen in operation. Address, "Cop," care Textile World Record, Boston, Mass.

BARGAINS FOR SALE

DYNAMOS — ENGINES

1 40 K. W. Direct Connected Set.
1 200 K. W. Direct Connected Set.
1 50 K. W. Direct Connected Set.
2 14x7x10 Deane Duplex Pumps.
100,000 ft. assorted widths single and double Leather Belting.
50,000 ft. Steam Pipe, assorted.
Boilers, Engines, Dynamos, Motors.
Write for Prices.

THOMPSON-BONNEY CO. 45-47 YORK ST., Brooklyn, N. Y.

WANTED.

Manufacturing Industries to locate in the healthful and conveniently situated village of Newport, N. Y. A large, practically new, substantially built mill, furnished with never-failing water power and lighted with electricity, now vacant and can be bought at a bargain. Also a smaller mill, with which electric power will be furnished. From 50 to 75 unemployed, experienced knit goods workers now reside here. An exceptionally desirable location for knit goods manufacturers. For further particulars, address

SECRETARY OF CITIZENS' ASSOCIATION,
Newport, N. Y.

Modern Hosiery Mill for Sale or Lease. Production: 300 dozen hose and half hose daily. Room and power for 1,000 doz. daily. Modern buildings, best machinery, good labor. Will sell entire plant or lease buildings and power plant and sell knitting, dyeing and finishing machinery. Or will sell majorty of capital stock to good parties who will operate plant. Good reason for selling. Apply to V. D. Molloy, Columbus, Miss.

For Sale. 1 100 Spindle Whitin Spooler, 6 in. traverse, 4 in. pitch. Practically new. Can be bought cheap. Stanley Manufacturing Co., Frankford, Phila.

For Sale. In Pennsylvania, one of the best equipped woolen mills in this country. Address "Penn.," Textile World Record, Boston, Mass.

Wanted. Competent plush and cotton-skein dyer. References required. Astoria Silk Works, 727-765 Steinway Ave., Long Island City, N. Y.

To Hosiery Manufacturers. For Sale 31 in. x 36 in. Weston Hollow-plate Press, with 15 plates. First class condition. Cheap before removal. Joseph L. Schmitt, 1501 N. 2nd St., Philadelphia, Pa.

Castings Brazed by FERROFIX

Textile Machinery of all kinds Repaired by Our Process.

NO PATCHES.

Enormous Saving Over Cost of New Parts.
A few hours time will do the trick.

COMMUNICATE WITH

THE AMERICAN FERROFIX BRAZING COMPANY,

EXECUTIVE OFFICES:
813A Arcade Bldg., Philadelphia, Pa.
or ARTHUR STEAD, Mgr. Textile Dept., 227 Chestnut St.

WORKS:
The Ferrofix Brazing Co., of Phila.
2024 Cuthbert St., Philadelphia, Pa
1541 Albright Ave., Scranton, Pa.
2930 Penn Ave., Pittsburgh, Pa.
New York Brazing Co., 329 W. 12th St., New York City.

GLASER MANUFACTURING CO.

MECHANICAL ENGINEERS.

Specialties in

MURKLAND, CROMPTON & KNOWLES LOOM PARTS.

Grinding and repairing all kinds of Shearing Machinery a Specialty.

2731-33-35 North 6th St., Philadelphia, Pa.

A Sewing Machine Company doing business among the Wholesale Clothing Firms of New York City, would like to handle in addition any kindred machinery or supplies in the trade. Have centrally located store and offices and well organized force of salesmen, including repair shop. Address "United," care of Textile World Record, 123 Liberty St., New York.

SITUATIONS WANTED.

Supt. and Genl. Manager of Seamless Hosiery would consider a change. Experienced on ladies', misses' and infants' goods, both wool and worsted. American; married; age 32, with an experience of 13 years; been with present concern 10 years, having bought all the stock and sold a part of the production. Must be in an up-to-date mill. Address Seamless, Textile World Record, Boston, Mass.

Salesman for hosiery an underwear. Age 37, single. Can furnish references. 3060, Textile World Record.

Boss Dyer. Scotch; married. Wool, worsted, carpet and cotton yarn, piece goods, dress goods, raw stock. Will not go West, South or to Canada Wants $3.50 or over. 3082, Textile World Record.

Boss Knitter (Saxon) on Flat and Noppen and Round Machines Noppen, Little Falls Patent, wants position. Age 38, with 12 years' experience in Germany and 10 years in the United States. Can give first-class references. Address "Saxon," Textile World Record, Boston, Mass.

Wanted Position. As knitter, expert on all makes of knitting machines, also expert on all makes of finishing machines. Know every detail of saving money in manufacturing. Address J. C. Wilson, 258 E. Division St., Chicago, Ill.

POSITION WANTED

by **Boss Dyer for Knit Underwear** or will take second hand position. 18 years' experience. Will guarantee to produce good results. Address "Knit Dyer," care Textile World Record, Boston, Mass.

SITUATIONS WANTED.

The following advertisements are a portion of those of superintendents and overseers, of whom full particulars are on file at this office. Manufacturers who may be in need of such men may address them in care of Textile World Record, or state their requirements directly, and the addresses of suitable men will be furnished without charge.

Mr. C. T. Donlevy, a practical mill overseer and superintendent, who has a wide acquaintance with mill men, is now a member of the Textile World Record staff, and gives special attention to this department. He would be pleased to hear from any of his friends who may be interested.

COTTON SUPERINTENDENTS.

Superintendent of a Cotton Mill; 45 years of age, married; Scotch; familiar with fancy ginghams, denims, flannels, and all kinds of sheeting. Has first-class references. 3318, Textile World Record, Boston, Mass.

Agent or Superintendent in a cotton mill. Worked on coarse and fine stock and is familiar with the coarsest and finest counts made in mills. Worked on both white and colored goods; 50 years of age; married, and could take a position ton, Mass.

Superintendent or boss carder of carding and spinning in cotton mill. Familiar with all kinds of cotton yarns, including high and low stock; familiar with combs; first-class references; 36 years of age; married. 3290, Textile World Record, Boston, Mass.

Superintendent in a Cotton Mill or overseer of carding in a large mill. Would prefer a position in Alabama. 42 years of age; American; familiar with both yarns and cloth. Worked in mills that have made yarns from 7s to 100s, American and Egyptian cotton. Has first-class recommendations. Could take a position at short notice. 3304, Textile World Record, Boston, Mass.

Superintendent or Superintendent and Designer in a cotton mill. Familiar with all lines of colored and cotton tickings, denims, shirtings, ginghams, lappet and dress goods. Worked on English and American machinery; 36 years of age; Canadian; Protestant; married; first-class recommendations. 3331, Textile World Record, Boston, Mass.

Superintendent of broad silk mill wants position. Age 39; English; married. Worked on mostly plain goods. Could be of good service to some reliable concern just starting up. Has small plant of his own which he would put in as stock with a first-class concern. 3154, Textile World Record.

Superintendent. Would like position in South. Not particular about salary to start. Machinist and thoroughly acquainted with all kinds of card room machinery, also spinning frames. Taken superintendent course in textile school and has had 23 years of practical experience in the mill, mostly on fine yarn work. 3044, Textile World Record.

Superintendent of cotton mill or overseer. Handled all kinds and numbers in yarn mills, cloth mills, colored warps, etc. Speeder, warper, spooler and spinner in the family. Age 48; American; married. 3219, Textile World Record, Boston, Mass.

Superintendent. All kinds of fancy cotton, white and colored, plain and fancy, jacquard and box work, also silks and worsteds. Would take good overseer of weaving position. 3120, Textile World Record.

Superintendent of yarn mill or plain cotton weaving or assistant. 33 years of age; American. Worked on all classes of yarn up to 50s and plain weaving. Married. 3226, Textile World Record.

Cotton Mill Superintendent. Overseer of weaving on mule spindles. Worked on fancy lenos, jacquards, fancy lappets, plain, fine and coarse cotton goods. Age 36; French-American. 3232, Textile World Record.

Superintendency of cotton mill wanted by a thoroughly practical cotton manufacturer of over 20 years' experience. Age 38; married. Temperate. Good manager. Fully competent to obtain full production at minimum cost and maintain best selling qualities. Highest references given. 1236, Textile World Record.

WOOLEN SUPERINTENDENTS.

Superintendent or Boss Weaver in a woolen mill. Worked on all kinds of woolen and worsted goods; familiar with all kinds of woolen machinery; 43 years of age; married; English. 3292, Textile World Record, Boston, Mass.

Superintendent, Designer or Boss Weaver. Age 48; American. Worked on all kinds of woolen goods, cotton dress goods, woolen and worsted men's wear. First-class recommendations. 1982, Textile World Record, Boston, Mass.

Agent, Superintendent or Designer in a woolen mill. Could accept a position in four weeks' notice. Familiar with all kinds of woolen goods, including cheviots, cassimeres, flannels, blankets and mackinaws. 28 years of age; American; first-class references from mills where he has been employed. 3280, Textile World Record, Boston, Mass.

Superintendent of Woolen Mill, or designer on either woolen or cotton goods. 40 years of age; familiar with all kinds of fancy worsteds, dress goods, men's wear and fancy cotton dress goods. Could be employed within a few weeks' notice. English; first-class references. 3111, Textile World Record, Boston, Mass.

Superintendent of Woolen Mill. 43 years of age; married; English; familiar with all kinds of woolen goods, including cassimeres, cheviots and fancy tweeds. Familiar with all makes of English and American machinery. Could take a position at short notice. 3310, Textile World Record, Boston, Mass.

Superintendent of a Woolen Mill. 44 years of age; American; married; familiar with all kinds of woolen goods, including cassimeres, dress goods, cheviots, covert cloth, cotton warp goods, both high and low stock. First-class recommendations. 3321, Textile World Record, Boston, Mass.

Superintendent, or would accept a position as overseer of finishing. Has had wide experience on all kinds of unions and satinets, and could take a position at short notice. First-class recommendations from good mills; 32 years of age; American; married. 3139, Textile World Record, Boston, Mass.

Woolen Superintendent or designer. Familiar with all kinds of fancy worsteds, dress goods, men's wear, fancy cotton dress goods. Familiar with all kinds of American and English machinery. First-class references. English, age 40. Address 3111, Textile World Record.

Superintendent or assistant superintendent. Is open for a position. Has worked on dress goods, suitings, beavers, broadcloths, carriage cloths and some worsted. Age 33, first-class references. 1575, Textile World Record.

Superintendent of woolen mill. Age 52. Was in business for himself for years. He is now open for a position. Age 52, married, first-class references from commission houses. 3227, Textile World Record.

Superintendent and designer, or assistant superintendent. Age 34; married. Worked on cloths ranging from all cotton to all wool and worsteds, such as cotton worsteds, jeans, army cloths, kerseys, etc. Excellent references. 3148, Textile World Record.

Superintendent. Has made yarn and shoddies and about everything in woolen line. Good general knowledge of woolen manufacture. Familiar with English, Belgium and American carding, spinning and preparatory machinery. 3088, Textile World Record.

COTTON CARDERS.

Carder in Cotton Mill. Coarse or fine, white or colored, hosiery, Egyptian, etc. Age 35; Canadian; married. 3029, Textile World Record.

Overseer of Carding. Has held all positions in picker and card rooms. White and colored goods, 8s to 40s. 3070, Textile World Record.

Overseer of Carding Department. Age 38; English; married. Plain and fancy goods; both combed and carded, Cotton Sea Island, Peruvian, Egyptian, Peeler, etc. Good references. 3196, Textile World Record.

Secondhand Carding or card grinding in a large mill. Worked on all white and colored goods, cotton from 4s to 70s. Good references. Age 29; German; unmarried. 3217, Textile World Record, Boston, Mass.

Overseer Cotton Carding or Spinning desires position. Age 47; American; married. Is familiar with all the modern makes of English and American machinery, revolving top flat cards, single and double carding. 2073, Textile World Record.

Overseer of Cotton Carding or superintendent of a small mill. Worked on coarse and fine yarns from 10s to 170s, carded and combed. Will not go West, South or to Canada. Age 37, American. First-class references. 1027, Textile World Record.

Overseer of Cotton Carding. Worked on all kinds of yarn. At present employed in a large mill, but will change for a better position. Familiar with all kinds of machinery. Will not go South. 36 years of age, French. 1991, Textile World Record.

Superintendent or overseer of carding in a large mill. Worked on sheetings, ginghams. Will not go West. Familiar with all kinds of cotton machinery. 41 years of age, American. First-class references. 2021, Textile World Record.

Overseer of Cotton Carding. Worked on plain and fancy coarse and fine white goods. Wants only Rhode Island or Connecticut. 47 years of age, married. First-class references. 1884, Textile World Record.

Overseer of Carding and Frame Spinning. Worked on all kinds of stock, both high and low. 30 years of age, first class recommendations. 1759, Textile World Record, Boston, Mass.

Overseer of Cotton Carding or assistant superintendent. Worked on all kinds of cotton, including cotton waste, sea island and down to sweepings. Familiar with all kinds of carding machinery, first class recommendations, 29 years of age, married. 3323, Textile World Record, Boston, Mass.

COTTON SPINNERS.

Overseer of Ring Spinning, spooling, long chain beaming, slashing and drawing-in. All kinds of fancies, sheetings, etc. $3.00 per day up. 3202 Textile World Record.

Overseer of Ring Spinning. Aged 42; American; married. Ginghams, sheetings, awnings, denims, etc.; $3 to $4 per day. 3018, Textile World Record.

Overseer of Cotton Mule Spinning. Understands Mason and English makes of mules. Has worked in mule room sixteen years, five years as second hand and a year and a half as overseer. 28 years old; married; steady and temperate. Would like to get work in N. E. or New York states. Has worked on colored hosiery yarn and filling. 1822, Textile World Record.

Overseer of Cotton Spinning or superintendent of a small mill. Would accept any reasonable offer. Worked on all grades of cotton goods and cotton yarns from 20s to 100s. Familiar with all kinds of cotton machinery. 44 years of age, American, married. 1882, Textile World Record.

Overseer of Mule Spinning who has had a wide experience in large New England mills on yar ranging from 24's to 160's is open to a position. .. years old; American. Good references. 2003, Textile World Record.

Overseer of Spinning. Age 34; married. Good experience. 20s to 90s Egyptian and American cotton. 3125, Textile World Record.

COTTON WEAVERS.

Overseer of Weaving. Good experience and reference. Worked on lawns, sheetings, sateens, dimities, fancies, etc. 3188, Textile World Record.

Overseer Cotton Weaving. Plain and a variety of fancies, lenos, etc. Good experience. A young man; English; married. 3147, Textile World Record.

Overseer of Weaving. Worked on sheetings, twills, sateens and fancies. Wants not less than $18 per week. 3157, Textile World Record.

Overseer of Weaving. Worked on all kinds of cotton goods, plain and fancy, including Turkish and cotton towels, also fancy worsted dress goods. Age 39; English; married. 3236, Textile World Record.

Overseer of Weaving or loom fixing. Worked on cotton, woolen, silk. Used to Crompton & Knowles looms, both box and plan, Lewiston looms, Mason, Colvin, Whiting, Patterson, etc. Age 43; Scotch; married. 3216, Textile World Record, Boston.

Overseer of Weaving or designer. Lawns, sheetings, twills, sateens, quilts, bedford cords, lappets. A young man; unmarried. Good experience and first-class recomendation. 3063, Textile World Record.

Boss Weaver wants position. Very wide experience. White and colored, plain and fancy. Understands all kinds of looms. 335, Textile World Record.

Overseer of Weaving. Familiar with shirtings, sheetings, lawns, cambric, ginghams, checks and stripes, union goods, awnings, ducks, drills, light and heavy weight, plain and fancy flannels. 39 years of age, American, first class references. 3257, Textile World Record, Boston, Mass.

Overseer of Weaving and Designing. Worked on plain and fancy goods, also jacquard work. First class recommendations, 33 years of age, English. 1397, Textile World Record, Boston, Mass.

Overseer of Weaving. Worked on ginghams, sheetings, shirtings and dress goods. Familiar with Crompton & Knowles and Mason looms. First class recommendations, 23 years of age. 3299, Textile World Record, Boston, Mass.

Overseer of Weaving. Worked on dobbies, fancy shirtings, madras, ginghams, twills and white goods. Will not go West or to Canada. 47 years old, married. First-class references. 3065, Textile World Record.

Overseer of Cotton Weaving. Worked on lenos, checks, plaids, fancy stripes, drop box and plain looms. First-class references. Will not go West or to Canada. Age 36, English. First-class references. 1855, Textile World Record.

Foreman of Weaving. Worked on ribbons of all descriptions, silk and cotton labels, tapes and lenos. Will not go to Canada or Maine. Age 34, American. First-class references. 3183, Textile World Record.

Overseer of Weaving, superintendent of weaving or designing. Worked on all kinds of cotton dress goods, also suitings. Familiar with all kinds of American and English looms and machinery. Age 41, English, widower. First-class references. 2058, Textile World Record.

Overseer of Cotton Weaving. Worked on all classes of fancy goods, such as lenos, handkerchiefs, and almost everything in the line of cotton. Can do his own designing. Age 35, married. First-class references. 1642, Textile World Record.

Superintendent or boss weaver in a cotton or woolen mill. Worked on sheetings, shirtings, ginghams, plaids, checks, cottonades and figured jeans. Familiar with all kinds of machinery. 45 years of age. First-class references. 1806, Textile World Record.

Overseer of plain cotton weaving, or secondhand. A young American; married. Worked on prints, sheetings, shirtings, cambrics, lawns, twills and sateens. Familiar with Whitin, Mason, Colvin and Draper looms. 3143, Textile World Record.

WOOLEN CARDERS.

Carder and Spinner. Been overseer 32 years, making every variety of cassimere, flannels, overcoatings, cloakings, dress goods, etc. Married; American. 3132, Textile World Record.

Overseer of Carding. Age 30; American married; Nearly all classes of goods. Good experience and references. Address 3170, Textile World Record, Boston.

Secondhand in wool card room. Age 23; American. Wool and cotton mixes. References. 3198, Textile World Record.

Second Hand of scouring and carding worsted in a large mill, or overseer in a small mill. Age 24; American; single. First-class references. 3246, Textile World Record.

Woolen Boss Carder. Worked on all classes of goods in hosiery and woolen mill. Familiar with Davis & Furber, Furbush & Cleveland cards; first-class references. Age 35, married. 1501, Textile World Record.

Woolen Boss Carder, or would accept a position as traveling machinist in setting up machinery. Worked on all classes of woolen goods, shoddy mixes, cotton mixes. Worked on Davis & Furber, Cleveland, Lombard, Platt Bros., Furbush & Smith machines. First-class references; age 47; married. 1578. Textile World Record.

Woolen Boss Carder. Worked on all classes of woolen goods, hosiery, dress goods, felts, blankets, cassimeres, satinets, slasher and roller cloth. Age 38; first-class references. Could take a position at short notice. 3258, Textile World Record.

Woolen Boss Carder. Worked on all classes of woolen goods, all wool, all cotton, and cotton and woolen and shoddy mixes. Familiar with all kinds of American carding machinery. First-class references. Age 44, married. 1953, Textile World Record.

Boss Carder in a woolen mill. Worked on all wools, cotton and shoddy mixes, and is familiar with Davis & Furber and Cleveland cards, and all makes of rub aprons and different rub rolls. 29 years of age, American, first-class references. No. 3284, Textile World Record, Boston.

Boss Carder or Spinner. Familiar with all kinds of American machinery, including Davis & Furber cards and mules; also Johnson & Bassett mules. Worked on all kinds of stock from the lowest to the finest grades of wool. 54 years of age; first-class recommendations. 3288, Textile World Record, Boston, Mass.

Boss Carder in a woolen mill. Worked on all grades of woolens, cotton and shoddy mixes. Familiar with all kinds of American machinery. First-class references; 31 years of age; German. 3316, Textile World Record, Boston.

Boss Carder in a Woolen Mill. Worked on satinets, cotton mixed dress goods, kerseys, etc. Could take a position at short notice; 34 years of age; Irish-American. 3319, Textile World Record, Boston, Mass.

Boss Carder and Spinner. Worked on all kinds of woolen and cotton and shoddy mixes; also knitting yarn. Familiar with Davis & Furber cards and mules, Johnson and Bassett, Lombard and Cleveland cards and mules. First-class recommendations; 36 years of age; American. 3302, Textile World Record, Boston, Mass.

Boss Carder in Woolen Mill, or would take a good second hand position. Worked on Davis & Furber and Lombard cards. First-class recommendations; 49 years of age; English. 3297, Textile World Record, Boston, Mass.

Boss Carder and Spinner in a Woolen Mill, or would accept a position as superintendent in small blanket or flannel mill. 54 years of age; English, first-class recommendations. 1798, Textile World Record, Boston, Mass.

Boss Carder and Spinner in a Woolen Mill. Familiar with all grades of woolen and mixed goods. Familiar with all makes of American carding and spinning machinery. Will not go West or South; 40 years of age; first-class recommendations; American. 3294, Textile World Record, Boston, Mass.

WOOLEN SPINNERS.

Boss Woolen Spinner. Would take a good secondhand job. Used to Davis & Furber and Johnson & Bassett machines. Worked on all kinds of goods. First-class references. 3215, Textile World Record, Boston.

Woolen Boss Spinner. Worked on all kinds of woolen goods. Familiar with Davis & Furber, Johnson & Bassett and Woonsocket mules. A first-class fixer. Could take a position at once. American; age 48. 3266, Textile World Record.

Woolen Boss Spinner, or would accept a good second-hand position. Familiar with all kinds of American spinning machinery; Davis & Furber, Johnson & Bassett, English mules, Curtis and Platt. First-class references; age 48, English. Could take a position at once. 589. Textile World Record.

Woolen Boss Spinner. Worked on all kinds of woolen yarns; worked on Davis & Furber, Johnson & Bassett, Bridesburg, Platt, and Lees & Moulton machinery. First-class references; English; 45 years of age. 3223, Textile World Record.

Boss Spinner in a woolen mill. 32 years of age, American, familiar with Davis & Furber, Johnson & Bassett and English mules and twisters. First-class references. No. 3275, Textile World Record, Boston.

Second Hand in Spinning Room or fixer. Worked on all kinds of woolen and cotton mixed yarns. Familiar with Davis & Furber and Johnson & Bassett mules. 30 years of age, married, American. No. 3282, Textile World Record, Boston.

Boss Spinner or Twister in woolen mill. Familiar with all kinds of woolen, shoddy and mixed goods. Davis & Furber, Johnson & Bassett and English mules. First class references. 32 years of age, American, 3281, Textile World Record, Boston, Mass.

Boss Spinner in woolen mill. Worked on all kinds of woolen, cotton and shoddy mixed goods. Familiar with Johnson & Bassett. Would prefer Furbush mules. First class recommendations. Age 29, American. 3287, Textile World Record.

MISCELLANEOUS.

Boss Carder or Superintendent of a shoddy mill. Familiar with all kinds of stock from highest to the lowest grades. All makes of woolen carding machinery. 30 years of age; married; American. 3307, Textile World Record, Boston, Mass.

Boss Carder in Woolen Mill. Familiar with all kinds of woolen shoddy and cotton mixed goods; also knitting yarn. Familiar with all kinds of American carding machinery and first-class recommendations. 45 years of age; Irish-American. 3313, Textile World Record, Boston, Mass.

Boss Carder in Woolen Mill. Worked on all kinds of woolen goods; familiar with Davis & Furber and Platt, Cleveland and Furbush machinery. First-class references; 26 years of age; German. 3298, Textile World Record, Boston, Mass.

Overseer of Dressing, Spooling and Winding. Worked on all kinds of woolen and worsted men's wear and ladies' dress goods. First-class references. 31 years of age, Scotch. 3269, Textile World Record, Boston, Mass.

Overseer of Ring Spinning, Spooling and Warping. Worked on all classes of goods, hosiery yarns, long and short staples from 8s up. Familiar with Sayles & Jenks, Mason, Lowell, Whiting and Saco & Pettee machinery. First class references. 28 years of age, married. 3308, Textile World Record, Boston, Mass.

Overseer of Silk Weaving. Worked on all kinds of plain silk goods. Familiar with Crompton & Knowles, Stafford & Thayer looms. Good references. 3303, Textile World Record, Boston, Mass.

Superintendent of Broad Silk Mill. Worked on all kinds of silk goods, piece dyes, cotton and silk mixtures, or would accept a position as overseer in any department. Age 40 years; married; first-class recommendations. 1726, Textile World Record, Boston, Mass.

WOOLEN WEAVERS.

Boss Weaver, second hand or loom fixer. Age 30; married. Wants $3 per day. Men's wear, dress goods and all kinds of fancy worsteds. Crompton & Knowles looms. Reference. 3182, Textile World Record.

Boss Weaver and designer. All grades of fancy dress goods, woolen and worsted, cotton and cotton mix kerseys, coverts and venetians. Plain and fancy men's wear. 3181, Textile World Record.

Woolen Boss Weaver. Worked on worsteds, woolens of all kinds, also dress goods. American; 38 years of age; married. 3231, Textile World Record.

Woolen Boss Weaver. Worked on plain and fancy piece dyed worsted, woolen, plain and fancy flannels, also fancy mercerized rain cloths. 29 years of age; Canadian; married. First-class references. 3251, Textile World Record.

Young Man, American, wants position as boss weaver or assistant superintendent. Has worked on fancy worsteds, cassimeres and cheviots. Can also design. 1712, Textile World Record.

Overseer of Weaving or designer. Familiar with all kinds of dress goods, lenos, lappets or any kind of fancy Jacquard weaving. Understands all kinds of English and American machinery. Age 46, English. First-class references. 3267, Textile World Record.

Overseer of Weaving. Worked on worsteds, cassimeres, dress goods, and all kinds of woolen goods. Crompton & Knowles looms. First-class references; American. 45 years of age. 3262, Textile World Record.

Boss Weaver in a woolen mill. Worked for the past twenty years in one of the best woolen mills in Massachusetts and eight years in the same mill for a former company. 57 years of age, married, English, first-class references. No. 3270, Textile World Record, Boston.

Assistant Designer or Boss Weaver in a woolen mill, 25 years of age, for two years was in a first-class Austrian textile school and passed the examination with distinction. Has first-class references, an Austrian and single. No. 3277, Textile World Record, Boston.

Loom Boss or designer. Familiar with blankets, flannels, skirtings, worsteds, woolens and piece dyes. Familiar with Crompton & Knowles jacquard and dobby looms. Age 33, married, American. 3150, Textile World Record.

Overseer of Weaving, or weaving and designing in first-class mill wants position. Will not go South or to Canada. $4.00 per day. Can furnish excellent references. 3056, Textile World Record, Boston.

Loom Fixer or second hand in weave room. Worked on all kinds of mixed goods, cotton and woolen dress goods, fine lenos, Jacquard and drop box looms. Age 33, French, good references. 3265, Textile World Record.

Boss Weaver in a Woolen Mill, or a fixing job with chance of advancement. Worked on worsted dress goods, cassimeres and cotton warp goods, beavers, etc. First class recommendations; 32 years of age, American. 3329, Textile World Record, Boston, Mass.

Boss Weaver in a Woolen Mill or superintendent of small mill. Worked on ladies' dress goods, men's wear, flannels, blankets, Indian robes, both jacquard and chain loom work. 38 years of age; married; first-class references. 3324, Textile World Record, Boston, Mass.

Boss Weaver in Woolen Mill, or would accept a good loom fixing position. Worked on satinets, cotton and woolen warp goods, sheetings, shirtings and ducks. Also worked on cotton and woolen jute bagging. 45 years of age. 1806, Textile World Record, Boston, Mass.

Overseer of Woolen Weaving or boss dressing. Worked on all kinds of woolen and worsted dress goods. A good manager of help. Could handle both dressing and weaving in medium sized mill. First-class references. 42 years of age. 3293, Textile World Record, Boston, Mass.

FINISHERS.

Overseer of Finishing Room. Cut and full fashioned balbriggan ribbed goods. Familiar with Union Special, Wheeler & Wilson, Willcox & Gibbs, Merrow, etc. Excellent references. Address 2168, Textile World Record, Boston.

Boss Finisher of underwear, cotton or wool mixed goods, who understands Wheeler & Wilson buttonhole machines, Union Button, Union Special, etc., is open to a position in the New England or Middle States. 30 years; American; married. Been employed for a number of years by concern for whom he is now working. Exceptionally good references. 1958, Textile World Record.

Overseer of Finishing. Age 32; American. Woolen and worsteds, suitings, coatings, cloakings, cassimeres, cheviots, meltons, frieze, etc. 2070, Textile World Record.

Boss Finisher. American. Cheviots, cassimeres beavers, dress goods, etc. Wants $2.50 to $3 per day. 3123, Textile World Record.

Woolen Boss Finisher. Worked on thibets, cotton and wool warps, satinets, unions, cheviots, kerseys, meltons and cassimeres. Aged 40. Will not go West or to Canada. American. First-class references. 3077, Textile World Record.

Woolen Boss Finisher in a medium-sized mill or second-hand in a large mill. Worked on cassimeres, cheviots, rain cloth, silk noils, dress goods, plain and fancy, piece dyed worsteds and cotton worsteds. Familiar with all kinds of finishing machinery, including crabbing machines. Will go anywhere for a good position. American, 23 years of age, good references. 3263, Textile World Record.

Boss Finisher, or would take a second-hand position or wet finishing. Familiar with all kinds woolen and worsted goods, both steam and dry finishing. Age 45, English, first-class references. 2061, Textile World Record.

Overseer of Finishing. Position wanted by man in the prime of life, energetic and a hustler, with 20 years of experience as overseer on all classes of goods from loom to case, in first-class mills. Age 46; married; steady, temperate and reliable. 3333. Textile World Record, Boston, Mass.

Overseer of Wet Finishing. Worked on all kinds of woolen goods, both high and low stock. Would accept a position at short notice. 47 years of age; married; first-class references. 3322, Textile World Record, Boston, Mass.

Overseer of Finishing. Familiar with all kinds of woolen and worsted men's wear, dress goods, including high lustre on ladies' and men's face finished goods, overcoatings, meltons and unions. 39 years of age; American; first-class references. 3271, Textile World Record, Boston, Mass.

Overseer of Finishing. Worked on all kinds of men's wear, fancies and piece dyed woolens and worsteds, dress goods of every description and face goods. First-class references; 36 years of age; Scotch. 3273, Textile World Record, Boston, Mass.

Overseer of Finishing. Familiar with all kinds of woolen and worsted goods. Will not go West, South or Canada. First-class references; 33 years of age; Swedish. 3295, Textile World Record, Boston, Mass.

Overseer of Finishing. Worked on all classes of woolen goods, both high and low stock. Familiar with all kinds of finishing machinery. Will not go West, South or Canada. Has three workers in the family for weaving and finishing room. 48 years of age; married. 3326, Textile World Record, Boston, Mass.

Overseer of Finishing of piece goods or assistant superintendent, or chemist. Familiar with all kinds of cotton goods, lawns, flannelettes and wash goods. Worked on all kinds of machinery, including Granger and Butterworth machines. First-class recommendations; 31 years of age; married. 3317, Textile World Record, Boston, Mass.

Overseer of Finishing. Worked on kerseys, cheviots, thibets, cotton worsted union cassimeres, ladies' dress goods and friezes. Both high and low stock. First-class references; 29 years of age; American; married. 3315, Textile World Record, Boston, Mass.

DESIGNERS.

Designer, woolen and cotton novelties. Used to fancy cassimere, ladies' dress goods, suitings and men's wear worsted, cotton and wool mixes. First-class references. Age 24; Scotch; single. 3212, Textile World Record, Boston.

Designer or boss weaver. Age 35; American; married. Worked on all kinds of worsteds, cheviots, men's wear, dress goods and coat linings. Used to Knowles and Crompton looms. First-class references. Can take position one week's notice. 3210 Textile World Record, Boston.

Designer or assistant designer. Worked on all kinds of sateens, fancy goods, dobbies and lenos. 21 years of age; American; single. First-class references. 3252, Textile World Record.

Designer, assistant designer or assistant superintendent. German. Woolen and worsted men's wear and ladies' dress goods. Experienced in Germany and a short time in this country. 3166, Textile World Record.

Designer or superintendent. Ginghams, crepe, jacquards, cycle tires, filter cloths, vesting cloth, etc. Good recommendations. Middle aged man; English; married. Address 3169, Textile World Record, Boston.

Designer or assistant superintendent. Worked on cotton warp flannel coverts, plain and fancy cotton warp, and all wool dress goods. First-class references. 3244, Textile World Record.

Jacquard Designer wants position or temporary work. Prefers designing for Jacquard blankets if

Designer or Assistant Superintendent desires a position. 27 years old; Scotch; married. Familiar with all well known makes of machinery and with woolen, worsted and cotton goods. Good references. Will go to any part of the United States. Terms reasonable. 1996, Textile World Record.

Designer in small mill or assistant in larger concern. Serges, cassimeres, shawls, and fancy worsteds and cotton goods. Wants only New England or Pennsylvania and New York. 3191 Textile World Record.

Assistant Designer or assistant superintendent. Young man; American. Men's wear, ladies' dress goods, shirtings, silk brocades, etc. Graduate of Philadelphia Textile School, and also has had short experience in mill. 3160, Textile World Record.

Designer on elastic webbing and non-elastic; 25 years of age; American. Worked on elastic and non-elastic webbing; also novelty effects, both on shafts and jacquard looms; also worked on tapes. First-class recommendations. 3300, Textile World Record, Boston, Mass.

Designer. Familiar with worsteds and woolens of all kinds. Could take a position at short notice. 28 years of age; German. 3264, Textile World Record, Boston, Mass.

Designer or Assistant Superintendent. Worked on woolen and worsted of all kinds and mixed goods. 21 years of age; first-class recommendations. 3296, Textile World Record, Boston, Mass.

Designer. Worked on ladies' dress goods, shirtings and flannels and some jacquard designing; first-class recommendations; 33 years of age; married. 3285, Textile World Record, Boston, Mass.

Designer. Familiar with suspender, elastic and non-elastic; also tapes and dress goods. 29 years of age; first-class references. 3186, Textile World Record, Boston, Mass.

Designer or superintendent. Age 37; English; married. Experienced in this country and England. Worked on cloakings, suitings, coverts, broadcloths, etc. Wants $30 to $40 per week. Mill closed, and wants place at once. Good references. 3140, Textile World Record.

Designer. Plain satin, fancy leno, checks, colored and dainties in cotton. Wants $3.50 or over a day. 3043, Textile World Record.

Designer or assistant. Worked on all classes of woolen and worsted goods, worsted mercerized men's wear and dress goods. Familiar with all kinds of woolen machinery. First-class references. Age 26. 3127, Textile World Record.

Designer. Understands all kinds of worsted and woolen goods for men's or women's wear. Could take a position at once. Age 28 years. First-class references. 3264, Textile World Record.

DYERS.

Dyer. Worked on piece dyes, wool, cotton, shoddy yarns, rags and union dyes and carbonizing. Wants place at once. Good experience and references. 3092, Textile World Record.

Dyer on all grades of worsteds, kerseys, broadcloths, knit goods of all descriptions, alpacas, mohair lining, ladies' dress goods, worsted yarn, cotton yarn, wool and cotton raw stock. Age 41; English-American. 3214, Textile World Record, Boston.

Overseer of Dyeing on all classes of worsted, woolen and union goods. Can take position on two weeks' notice. Age 26; American; single. First-class references. 3224, Textile World Record, Boston.

Secondhand in dyehouse. Would accept a position as salesman. Worked in first-class worsted and woolen mills. Age 26; American; unmarried. Can take place on short notice. 3211, Textile World Record, Boston.

Overseer of dyeing and finishing, all kinds of worsteds, woolen, fancy mix, indigoes, and raw stock. 36 years of age; married. 3233, Textile World Record.

Boss Dyer in a woolen mill. Has been for the past ten years with one of the largest woolen mills in the Middle States; has first-class references; 47 years of age, American. No. 3286, Textile World Record, Boston.

Boss Dyer in a woolen mill. Has been for twenty years boss dyer for one company, and is familiar with hosiery dyeing. 47 years of age, American, first-class references. No. 3278, Textile World Record, Boston.

Foreman for Aniline Black Department, all silks, cotton, black and taffeta umbrella goods. Age 32; English; married; first class references. 3238 Textile World Record.

Dyer. Age 33; Scotch; unmarried. Worked on every kind of woolen cloth, serges, meltons, shoddy worsted and woolen yarn, etc. Wants $5.50 per day. Will not go South. 3064, Textile World Record.

Boss Dyer. A young man; unmarried. Worked on knit goods, raw stock, dyeing wool and cotton. Refers to past employers. 3069, Textile World Record.

Dyer. Worked on all classes of goods, woolens, worsteds, yarn, piece dyes, slubbing, blue vats and cotton mixes. An American; married. 3085, Textile World Record.

Fancy Dyer. Aged 37; American; married. Cotton, wool and silk. 3158, Textile World Record.

Overseer of Dyeing. Men's wear and dress goods, loose wool, piece dyes and yarns. Good experience. 3161, Textile World Record.

Boss Dyer, second hand, assistant superintendent or designer. Worked on shirtings, blankets, satinets, raw wool and cotton, fast to milling, cross dyes and familiar with all dyestuffs. Good references. Age 27, single. 3229, Textile World Record.

Boss Dyer. Worked on cassimeres, cheviots, wool and union piece dyes, shoddy, alizarine colors and all classes of woolen goods. Age 44, French-American. Address 877, Textile World Record.

Boss Dyer, scourer and bleacher in a knitting mill. Worked on all grades of knitted underwear. First-class references. Will not go West or to Canada. 41 years old, married. First-class references. Address 3004, Textile World Record.

Boss Dyer on cotton goods, chain warps, filling, raw stock, underwear, hosiery yarn, print yarn, cop bleaching. Will not go South. 29 years old, married. First-class references. 1730, Textile World Record.

Assistant Superintendent dyeing, printing and finishing plant. Worked on all cotton, silk noils, cotton and silk goods and all silk goods. First-class references. Will not go West, South or to Canada. Age 28, married. Address 3136, Textile World Record.

Boss Dyer or overseer of finishing. Worked on aniline black on hosiery, cotton and wool hosiery, underwear, cotton yarns, woolen dress goods, raw stock and piece dyes. Finished all kinds of hosiery. Will not go South or to Canada. First-class references. Age 35, married. 1057, Textile World Record.

Boss Knitter or superintendent of a hosiery mill. Worked on worsteds and cotton, infants' and misses' and ladies' and men's half hose. First-class references; 37 years of age; American. 3268, Textile World Record, Boston, Mass.

Boss Knitter. Worked on sweaters, toques, both woolen and worsted, cylinder and flat machines. Could take position in one week's notice. First-class recommendations; 33 years of age; married. 3278, Textile World Record, Boston, Mass.

Boss Knitter or Superintendent of knit underwear. Worked on all kinds of ribbed underwear and all makes of machinery. First-class recommendations. 3306, Textile World Record, Boston, Mass.

Foreman of Cutting Department in a knitting mill, or an assistant. Worked on all kinds of knit goods, with four knife or by hand, with knife or shears on fine work. Will guarantee 100 dozen per day. Will not go South or Canada. 24 years of age; American. 3320, Textile World Record, Boston, Mass.

Superintendent of Bleachery. Worked on all kinds of lawns, lenos and colored lawns, towels, colored and white ducks, drills, tickings, shirtings and hosiery. Familiar with all kinds of bleaching machinery; first-class references; 55 years of age. 3245, Textile World Record, Boston, Mass.

Overseer of Bleaching, Dyeing or Mercerizing. Worked on cotton piece goods, yarns, hosiery and underwear. First-class recommendations; 38 years of age; married. 1933, Textile World Record, Boston, Mass.

Boss Dyer or Bleacher. Worked on all kinds of piece goods, yarns and dress goods. Familiar with all kinds of bleaching and dyeing machinery; 38 years of age; French. 3312, Textile World Record, Boston, Mass.

Superintendent of a Bleachery or Dye Works or overseer of mercerizing. Worked on all kinds of goods, including bed spreads, towels, ducks, sheetings, drills, cambrics, cotton flannel, bags, shoe lining and window shades. 42 years of age; married; English. 3274, Textile World Record, Boston, Mass.

Assistant Superintendent or in the selling office. Familiar with broad silks of all kinds, ribbons and velvets; also cotton, flax, jute and hemp. Artificial silks, also all kinds of textile fabrics and yarns. First-class recommendations. 1994, Textile World Record, Boston, Mass.

Boss Knitter in underwear mill; good practical man on flat rib frames and on any of the prominent makes of latch and spring needle machines, fleece-lined excepted; 42 years of age; American; married. 3330, Textile World Record, Boston, Mass.

Overseer of dressing. American. Married. Wool, worsted and cotton worsteds. 3165, Textile World Record.

Overseer in winding, spooling and thread dressing. Age 34; Scotch; married. Also had some experience in beaming. Shoe and corset lacing, plain and fancy braids and tapes, fine ginghams and dress goods. 3192, Textile World Record.

Master Mechanic in cotton or woolen mill or cotton finishing plant. American; married. Good experience and reference. 3189, Textile World Record.

Overseer of Finishing and Dyeing. Worked on woolens, worsteds, men's wear and ladies' dress goods. For the past 7 years with a first-class mill; 39 years of age; good references. 1210, Textile World Record, Boston, Mass.

Overseer of Finishing. Familiar with narrow union goods, both high and low stock, including thibets, satinets and unions; 29 years of age, American; married. 3283, Textile World Record, Boston, Mass.

Overseer of Finishing. Worked on cotton unions, dress goods, cassimeres, beavers, kerseys, covert and army goods. First-class recommendations; 55 years of age. 1661, Textile World Record, Boston, Mass.

ARE YOU IN LINE FOR PROMOTION?

Thousands of men have been promoted and are receiving **higher pay** as a result of studying with the International Correspondence Schools. Their **SCHOOL OF TEXTILES** conducted at New Bedford, Mass., by an expert staff of **Practical Instructors** is devoted solely to teaching Cotton and Woolen Manufacturing and the Weaving and Designing of Fabrics.

Students enrolled after this date receive instruction by means of extended and newly **Revised Instruction Papers** just published and in addition receive a set of invaluable **Bound Volumes** for reference.

Stop and consider how you can increase your knowledge, obtain a higher position, earn more pay and perform more congenial work by taking one of our fifteen complete, concise, practical I. C. S. Textile Courses.

Cut out, mark and mail the coupon below. It costs you but two cents and puts you under no obligation.

C. P. BROOKS, Principal, Textile Department, International Correspondence Schools, New Bedford, Mass., Box 836:
Please send me a free copy of "1001 Stories of Success" and give me information regarding the Course before which I have marked X.

Complete Cotton Manufacturing	Cotton Designing
Cotton Carding and Spinning	Woolen and Worsted Designing
Cotton Warp Preparation and Plain Weaving	Complete Woolen Manufacturing
Fancy Cotton Weaving	Woolen Carding and Spinning
Cotton Carding, Spinning and Plain Weaving	Woolen Carding, Spinning and Weaving
Yarn Reeling, Winding and Warping	Woolen Warp Preparation and Weaving
Complete Textile Designing	Worsted Warp Preparation and Weaving
Theory of Textile Designing	

Name.....
Occupation.....*Age*.....
House Address.....
Business Address.....
City..... *State*.....

KNITTERS.

Superintendent of underwear or boss knitter. Worked on all kinds of underwear from fine to coarse. Worked on all kinds of knitting machinery. Would prefer a position in the West. 51 years of age, English, married. Address 3176, Textile World Record, Boston.

Manager or assistant, or executive position in an underwear mill. Worked on fine wool and cotton knit underwear from raw material to finished product. Some knowledge of hosiery. Will not go West or South. 54 years of age, American, married. 3109, Textile World Record, Boston.

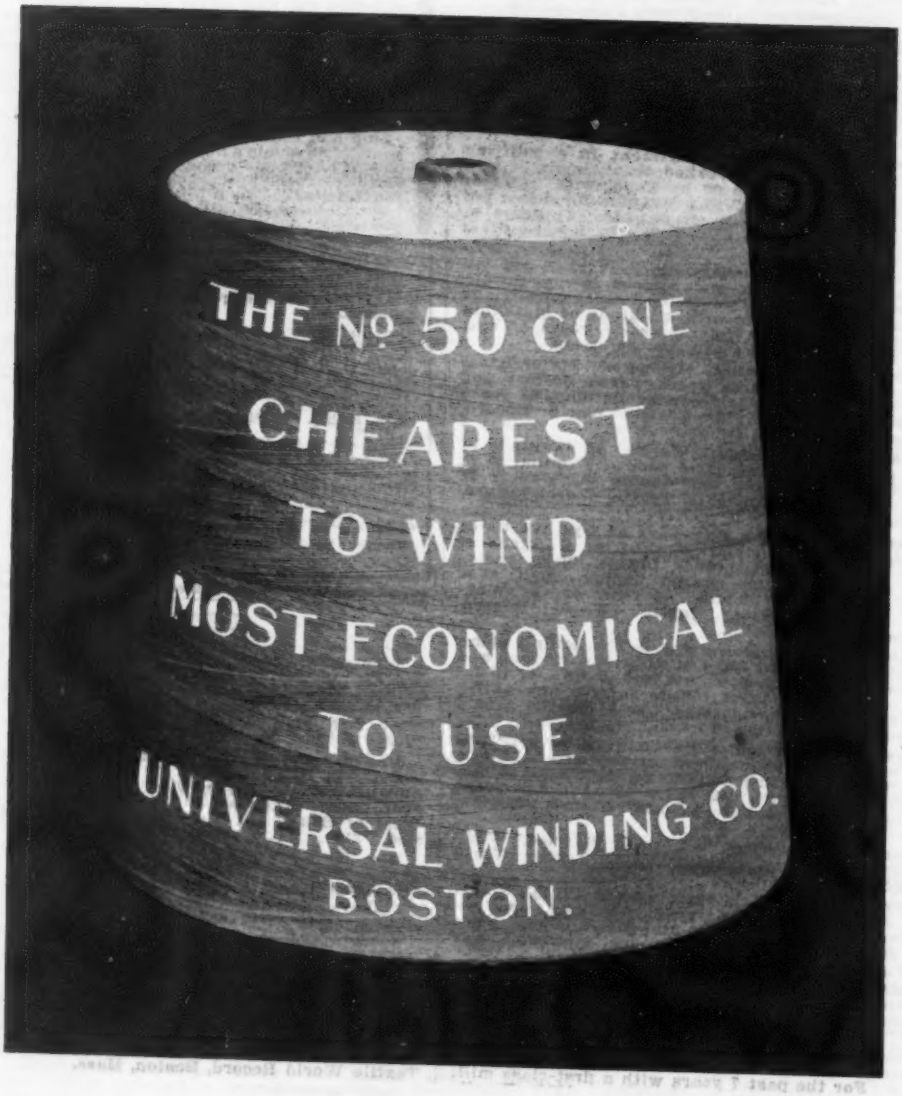
Boss Knitter in underwear mill. Worked on all gauges as fine as 28, wool, cotton and silk. Latch and spring needle machines. 39 years of age, American, married. 1669, Textile World Record, Boston, Mass.

Superintendent or boss knitter. Worked on latch needle goods, light and heavy weight underwear only. 38 years of age, American, married. 1812, Textile World Record, Boston, Mass.

Superintendent or boss knitter. Worked on men's fine balbriggan, ladies', men's and children's wool underwear. Familiar with all kinds of knitting machinery. 27 years of age, American. 3259, Textile World Record, Boston, Mass.

Superintendent of a knitting mill. Worked on cotton, wool, merino and silk, plain and ribbed hosiery and underwear. Will not go South or West. First-class references. American, 42 years old, married. 1722, Textile World Record, Boston.

Foreman and Machinist. Young man with experience on all kinds of knitting and sewing machines in men's, ladies' and children's hosiery. Wants position as fixer or assistant superintendent in a hosiery or underwear mill. 25 years old; single; good references. Open for a position October 15th. 3314, Textile World Record, Boston.


THE No. 50 CONE
CHEAPEST
TO WIND
MOST ECONOMICAL
TO USE
UNIVERSAL WINDING CO.
BOSTON.

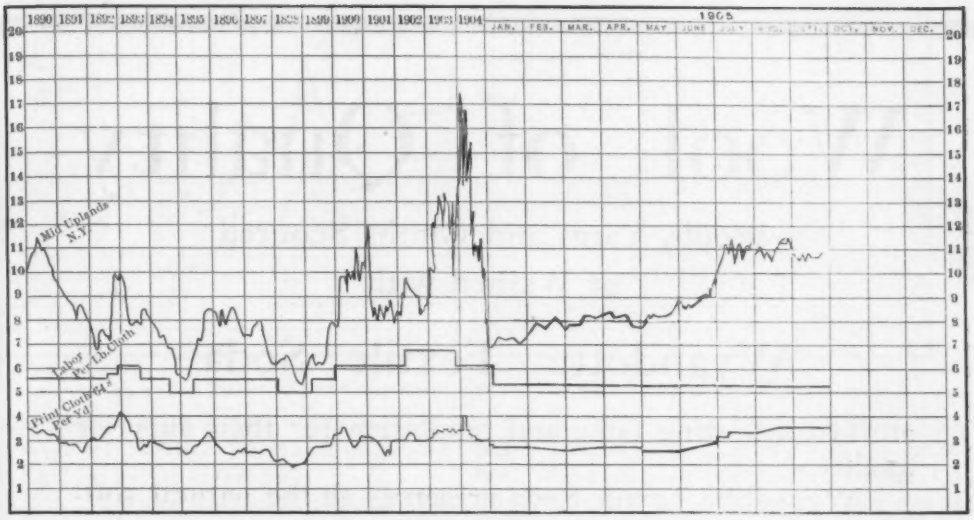

1890 1891 1892 1893 1894 1895 1896 1897 1898 1899 1900 1901 1902 1903 1904
1905
JAN. FEB. MAR. APR. MAY JUNE JULY AUG. SEPT. OCT. NOV. DEC.
Mid Uplands N.Y.
Labor Per Lb. Cloth
Print Cloths 64 Per Yd.

CHART SHOWING RANGE IN THE PRICE OF COTTON TO DATE.

Cotton Market.

Aside from an advancing tendency the cotton market has exhibited no special feature during the past month. Reports of the new crop have been as usual conflicting with little to choose between bull and bear stories. The planters have strengthened the market by a resolute refusal to sell except at full prices. Prices are regulated largely by sentiment and just at present there is unquestionably a strong sentiment in the South that cotton is good property to hold. The effect of this is heightened by the ability of the grower to hold his cotton, and it is not likely that the next few months will witness such a pronounced decline as had been the almost invariable rule for the past sixteen years. A glance at the chart shows that at this time of year the arrival of the new crop on the market has been accompanied by a decline. In some years this decline has been the continuation of a downward movement begun earlier in the year, but even a strong advance in other years has been checked and followed by a decline under the influence of the increased supply of new cotton.

If, then, a decline takes place within the next few months it will be in accordance with the history of many years, but the changed conditions in respect to the planter's financial ability to hold his cotton may make 1905 a record breaker. The government crop report stating a condition of 71.2 per cent, published on October 3, was followed by a break in the market. Whether this is the beginning of a downward movement customary at this time of year is a question that only time can settle. The large demand throughout the world and the uncertainty of conditions affecting the present crop are factors that may counteract the influence of government reports.

The movement into sight from Sept. 1 is reported by the Chronicle for a series of years as follows:—

1900 to Sept. 28	831,575	bales.
1901 to Sept. 27	595,023	bales.
1902 to Sept. 26	1,635,784	bales.
1903 to Sept. 25	523,015	bales.
1904 to Sept. 22	820,767	bales.
1905 to Sept. 22	860,327	bales.

The world's stock is estimated by the same authority as follows:—

Bales.	1905	1904	1903	1902
American,	1,946,823	872,357	622,462	1,306.737
East Indian,	789,000	556,000	535,000	455,000
	2,735,823	1,428,357	1,157,462	1,761,737

WEIMAR BROS. MANUFACTURERS OF Cotton Mercerized Tapes,

SPOOL TAPES, BINDINGS AND NARROW FABRICS FOR UNDERWEAR AND OTHER TRADES.

Phone Connections. Works, 2046-48 Amber Street. PHILADELPHIA, PA.

Wool of Quality

Wools, Yarns and Cloths Scoured
or Washed with

Wyandotte Textile Soda

are fast achieving fame and reputation for their superior quality.

Wyandotte Textile Soda preserves all the natural softness, openness and elasticity of the fiber. It gives a quality of wool which all Mill Men are striving to attain, for not only do such wools and woolens appear soft to the touch and attractive to the eye, but they are more lasting and when made into garments wear much longer.

When you can obtain the same quality of cloth, with the same softness, equally as good color, in fact with everything just as satisfactory as can be produced from an 18 c. wool if properly scoured as against a wool for which you are now paying 20 c., then you are interested in knowing the process.

Send for our Free Booklet on Wyandotte Textile Soda.

None Genuine except with a card bearing this Trade Mark

In Every Package.

The J. B. Ford Co.,

SOLE MANUFACTURERS,

Wyandotte, Mich.

THIS SODA WAS AWARDED THE HIGHEST PRIZE—GOLD MEDAL—AT THE ST. LOUIS EXPOSITION.

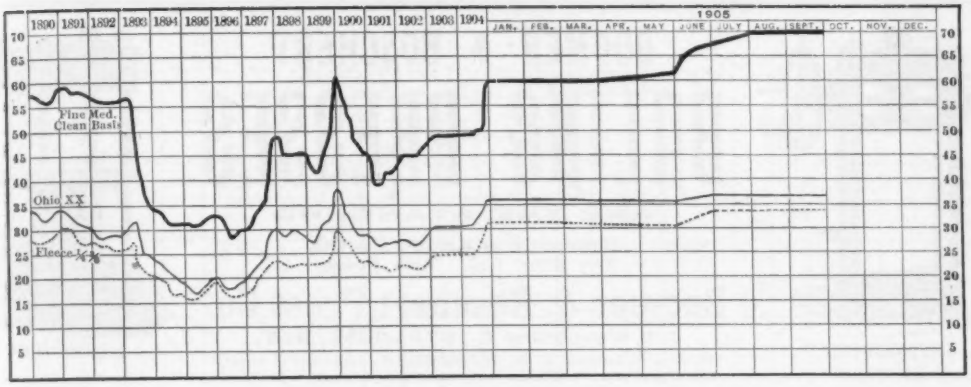


CHART SHOWING RANGES IN THE PRICE OF WOOL TO DATE.

Egyptian cotton has been firm and in good demand. Stoddard, Haserick, Richards & Co. report on the Egyptian market as follows:—

"The new crop market has been very steady, with a rather advancing tendency.

"There is small business doing in the old crop cottons at a steady price. This is limited by thea small supplies available.

"We are informed that the cotton plants have largely profited by the favorable climatical conditions during August. The supply of water has been sufficient, though not abundant. The crop as a whole looks well and promises a better result than in 1904. No estimate has, however, been recorded. It is expected that the picking will begin about the same time as last year."

(For Wool Market see page 237.

STANDARD QUALITY COMBED RAMIE TOPS and NOILS a Specialty. RAMIE YARNS in All Numbers for All Purposes.

Wool, Mohair, Camel Hair, Silk, and Ramie Tops and Noils.

FRANK A. TIERNEY,

Wool, Tops, Noils, Yarns.

Woolen, Worsted, Mohair, Ramie and Silk Knitting Yarns

All Kinds of Yarn for Weaving Purposes. Special Fibres and Novelties for Woolen, Cotton and Silk Manufacturers.

Room 203, Wool Exchange Building, 260 West Broadway, New York.

Wool and Woolen Goods Made **NONSHRINKABLE** by the use of "Nevershrink Process."

May be applied at any stage of manufacturing. Write for Booklet.

CHARLES H. HEYER,

1501 Real Estate Trust Bldg. Philadelphia, Pa.

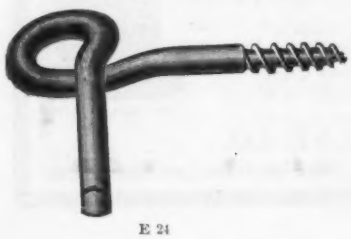
FOR WOOL Nevershrink TRADE MARK

MITCHELL-BISSELL CO.

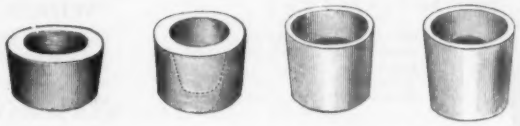
38 MURRAY STREET, NEW YORK.

PORCELAIN, ENAMELLED IRON AND GLASS FOR TEXTILE MACHINERY.

Right Angle Pontiac Guide.



E 24



143 704 258 5219

Creel Steps.

E 8

KNUCKLE JOINT.

BOOMER & BOSCHERT

BALING PRESSES

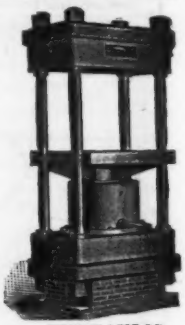
ARE THE STANDARD

Hydraulic or Knuckle Joint
Any Size .. Any Power

Boomer & Boschert Press Co.

338 West Water S., SYRACUSE, N. Y.

Southern Agent, A. H. WASHBURN, Charlotte, N. C.



HYDRAULIC.

DE HAVEN ALL-STEEL RING TRAVELERS

The only All Steel Ring Traveler ever made.

The reign of the Ring Traveler Octopus is over.
Independence and Progressive Methods have clipped his claws.

The DE HAVEN ALL-STEEL TRAVELERS save Cotton, Time and Money. Use them and pay dividends.

MANUFACTURED ONLY BY DE HAVEN MANUFACTURING COMPANY, Nos. 60-62-64 COLUMBIA HEIGHTS BROOKLYN, N. Y.

The Success of the Mill Depends on its Travelers.

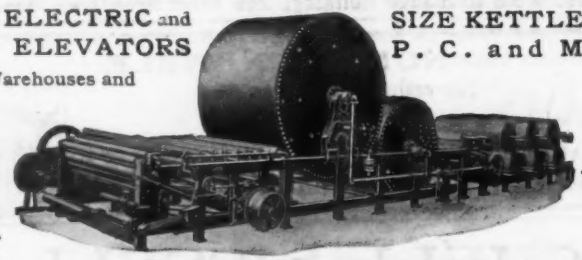
The COHOES SLASHER.

BELT-DRIVEN, ELECTRIC and HAND-POWER ELEVATORS

For Cotton Mills, Warehouses and Factories.

PULLEY BLOCKS.

OVERHEAD TRACKS.



SIZE KETTLES. REPAIRS for P. C. and M. MULES and EMPIRE LOOMS

WATERWHEEL GOVERNORS.

The COHOES IRON FOUNDRY & MACHINE CO., Cohoes, N. Y.

Your Safety Depends on the Efficiency and Strength of Your Valve.
BETTER BE SAFE THAN SORRY.

Water-Relief Valve.

BUY CROSBY STEAM APPLIANCES WHICH ARE RELIABLE

WRITE FOR CATALOGUE.

Steam Engine Indicators
Recording Gages
Blow Off Valves
Brandon Rubber Pump Valves
Single Bell Chime Whistles
Feed Water Regulators
Lubricators
Pressure and Vacuum Gages
Water Gages, Gage Glass, Etc.

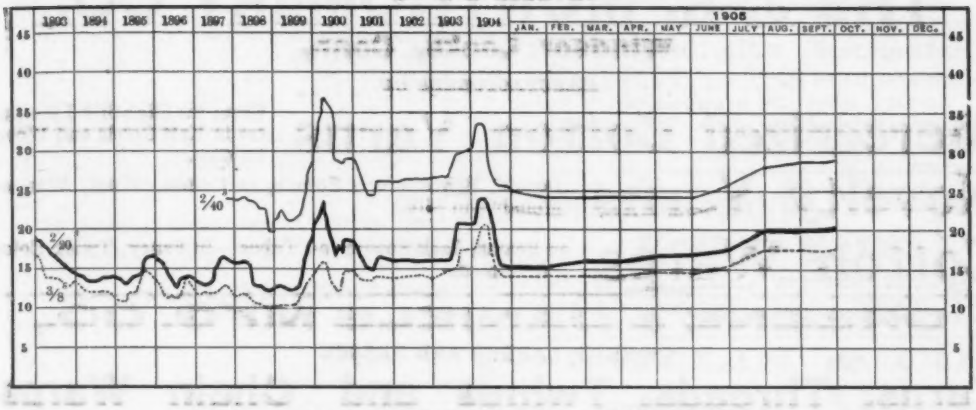
ENGINE—BOILER AND MILL SUPPLIES

Pop Safety Valve

CROSBY STEAM GAGE AND VALVE CO.

Stores, BOSTON, NEW YORK, CHICAGO, LONDON. Office and Works, BOSTON, MASS.

Yarn Department.



GRAPHIC CHART SHOWING RANGE OF PRICE OF COTTON YARN TO DATE.

Wool Market.

This market has continued strong, although prices at which business has been done have not advanced. Asking prices are higher and reflect the increased confidence in a continuance of the present high prices. The wool situation has reached that stage where the manufacturers themselves would not welcome any decline in prices. The mills have been using high priced wool for months, and as a consequence woolen manufacturers have large investments represented not only by raw wool, but also by goods and stock in every process of manufacture, all based on the high level of prices shown which has prevailed since January 1, and which is clearly shown on our chart. Under these conditions a decline in the market value of wool would mean a corresponding shrinkage in the value of the wool goods, stock in process and raw material owned by mills, and would entail heavy losses on woolen manufacturers throughout the country. With their present heavy investments in high priced raw material the woolen manufacturers, with few exception, woul oppose a decline. Fortunately for them there is little prospect of a weakening of prices. Reports from Europe are distinctly bullish. At the last London sales an advance of 5 to 7 per cent was recorded and in all the markets. Continental as well as English, buyers of wool are contending with reduced stocks on nearly all grades. Purchases for American account have been heavy and the European wool trade has been staggered by the high prices bid by American buyers.

The heavy weight season is approaching and the mills must be supplied with raw material from existing stocks. For this reason prices are not likely to decline and the new clip will arrive next summer with available supplies reduced far below the present level. These conditions are stimulating manufacturers in their efforts to reduce the quantity of wool per yard and as a consequence wool substitutes which will take a "worsted" finish are eagerly sought for.

Cotton Yarn Market.

Following a brief period of weakness the cotton yarn market rallied at the close of the month in sympathy with a strengthening demand and higher prices for the raw material. Spinners generally have orders booked for months ahead and are under no necessity of shading prices in order to secure business. Stocks are of moderate size and some sizes are positively scarce. The spinners who took orders during the decline last month are regretting their haste. The belief is now prevalent that a material decline is not among the probabilities. Both buyer and spinner are adjusting their business to the present level of values. The weavers and knitters have large stocks of goods in process made from yarn bought near the present level of prices and would not welcome a decline of such proportions as would disturb the goods market and lead their customers to cancel old orders or stop placing new contracts.

Knitters are doing a good business, but as a rule are buying yarn only for immediate requirements in order to be in a favorable position if the cotton market should break. The whole situation hinges on the new crop of cotton, and this factor is still involved in much uncertainty. We quote as follows:—

Eastern Cops.

6's	17¾
8's	17¾
10's	18¼

THE J. R. MONTGOMERY CO.,

Windsor Locks, Conn.

MANUFACTURERS OF

Mercerized Cotton Yarns Gives the High Silk-Like Lustre in Knit Goods and Woven Fabrics.

Novelty Yarns Boucle, Bourette and Spirals, in Cotton, Wool, Worsted, Mohair and Silk.

Cotton Warps on Beams, Jack Spools and Tubes. In Fancy, Twist, Colors and Printed.

GREENE & DANIELS MFG. CO.,

COMBED, CARDED AND GASSED

Yarns, Threads, Twines and Chain Warps,

Colored and Bleached Yarns Furnished in any manner desired by the trade.

Pawtucket, R. I.

WALCOTT & CAMPBELL SPINNING COMPANY

Fancy Hosiery Yarns

IN ALL COLORS

New York Mills, Oneida Co., New York.

Wiscasset Mills Co. | Patterson Manfg. Co.
Efrid Manfg. Co. | Tuscorora Cotton Mill.

HIGH GRADE HOSIERY YARN

White and Colors. All Numbers.

Sewing Twines on Cones and Tubes.

SPECIALTIES IN WEAVING YARN.

Black and white. Double and twist for woolen trade.

CANNON MILLS, 55 Leonard St New York.

THESE MULES CANNOT BREAK THE BANDING —MADE BY—

M. J. TOOHEY & CO., OF FALL RIVER, MASS.

Banding made from Egyptian or White Cotton Yarn as Desired.

The Other Fellows Banding.

MONUMENT MILLS,

Manufacturers of

White, Colored, Fancy and Double Twist

COTTON WARPS

HOUSATONIC, MASS. 4s to 60s.

Dana Warp Mills

WESTBROOK, ... MAINE

White and Colored Warps 6s to 50s Single and Ply

Mule Cops From 30s to 50s from American & Egyptian Cotton

14's	19¼
16's	19¾
18's	20¼
20's	20¾
22's	20¼
24's	21¾
26's	22¼
30's	23¼
34's	24¼
36's	25¾
40's	26¾

On cones, ¾c. more up to 14's; 1c. more from 15's to 22's; 1½c. from 23's to 35's, and 2c. above that.

Eastern Two-Ply Skeins, Carded Peeler.

12's	21
14's	21½
18's	22½
20's	23½
24's	24½
26's	25½
30's	27½
36's	29
40's	32
45's	35
50's	37
55's	41
60's	44

Eastern Two-Ply Warps, Carded Peeler.

2/30's	28
2/36's	29½
2/40's	32
2/45's	35
2/50's	38
2/60's	44

Egyptian Weaving Yarns.
Single Skeins Combed.

30's	35
36's	37
40's	39
45's	43
50's	48
55's	51
60's	54
70's	57

Philadelphia Yarn Market.

The yarn market has been rather sensitive and has followed the cotton market very closely in hardening and softening of prices. Two ply yarns have been a little easier to get recently, and prices have been from 1/2 to 1c. per pound lower on this class of goods. Stocks have not been large and the efforts of buyers to force the market down has only met with partial success. There is a good demand for most all kinds of yarn, and while this lasts there is not much danger of a sharp break in prices, and there are strong influences at work on the bull side of the cotton market, which will undoubtedly hold the price of cotton at, or near, its present basis. There is a good demand for most all kinds of yarn for spot delivery.

Prices today are about as follows:—

PAULSON, LINKROUM & CO.
Successors to BUCKINGHAM, PAULSON & CO.
Commission Merchants
COTTON YARNS of all Descriptions
83 Leonard St., NEW YORK
302 Chestnut St., Phila. 210 Munroe St., Chicago, Ill.
Cash Advances, Cash Sales and Prompt Returns. Consignments and correspondence solicited.

JAMES E. MITCHELL CO., COMMISSION MERCHANTS
Cotton Yarns
FOR ALL PURPOSES.
122-124 Chestnut Street, PHILADELPHIA, PA.
Brown Building, 185 Summer Street, BOSTON, MASS.

CATLIN & CO.,
Cotton Yarns
345 Broadway, NEW YORK.
67 Chauncy Street, BOSTON.
206 Chestnut Street, PHILADELPHIA.
605 Medinah Temple, CHICAGO.

Harding, Whitman & Co.,
Dry Goods Commission Merchants,
COTTON AND WORSTED YARNS.
BOSTON. NEW YORK. PHILA.
CHICAGO. BALTIMORE. ST. LOUIS.

A. D. SALKELD & BRO.,
With FRED'K VIETOR & ACHELIS,
YARNS.
66-72 LEONARD STREET, - NEW YORK.

Fred Sternberg & Co.
530 Broadway, - NEW YORK.
MERCERIZED TURKEY RED GASSED } COTTON YARNS.

E. D. LORIMER & CO.
COTTON YARNS } ALL NUMBERS
MERCERIZED YARNS } FOR ALL PURPOSES
346 BROADWAY, NEW YORK.

MOELLER & LITTAUER,
SILK, WORSTED, WOOLEN YARNS COTTON AND MOHAIR
Polished Threads and Tinsel. Artificial or Wood Silk.
Mercerized, Turkey-Red, Fine Gassed Yarns.
109 GREENE ST., NEW YORK

SPINNING MILLS:
NEW BEDFORD, FALL RIVER, TAUNTON.

DYE AND BLEACH WORKS:
FALL RIVER, TAUNTON.

NEW ENGLAND COTTON YARN CO.

KNITTING AND
WEAVING YARNS

EVERY DESCRIPTION AND FORM

Gray, Bleached, Dyed and Mercerized

600,000 MULE AND FRAME SPINDLES

C. MINOT WELD, President.
HENRY C. SIBLEY, Treasurer.

ARTHUR R. SHARP, General Manager.

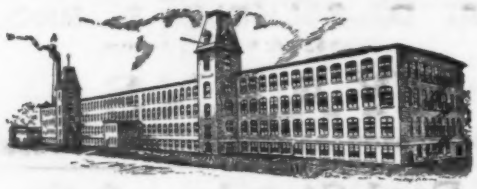
Executive Office:

141 Milk Street, Boston.

BRANCH OFFICES:
ALBANY, Broadway, cor. State St.
CHICAGO, cor. Clark and Adams St.
NEW YORK, 73 Worth St.
PHILADELPHIA, 213 Chestnut St.

C. T. Crocker, Pres. W. F. Stiles, Treas.

ORSWELL MILLS



Fitchburg, Mass.

Capacity, 45,000 Spindles.

HIGH GRADE YARNS

From Egyptian and Peeler Cottons, Carded or Combed, in Chains and Skeins, on Balls, Beams, Spools, Cops, Cones, Tubes, Single or Twisted.

JENCKES SPINNING CO.,

Formerly E. JENCKES MFG. CO.

Carded and Combed Cotton Yarns for Weavers and Knitters.
Double and Twist Yarns for Woolen Trade.

PAWTUCKET, R. I.

GRANT YARN CO.,

COMBED AND CARDED COTTON.

YARNS 40's and above. AND
FITCHBURG, MASS. WARPS

Indian Orchard Company

Cotton Warps and Yarns. In Gray and all Colors, Single or two or more Ply and Cable Cord.

Novelty Yarns. in Various Patterns, Colors and Twists.

Carded and Colored Cotton. For Mixing with wool, Machined or in Roving.

Indian Orchard, Mass.

T. MORGAN-PRES. H. K. WRIGHT-TREAS. W. C. GODFREY-AGT.

Southern frame spun cones:—

7's and Coarser	18
8's and 9's	18
10's	18
12's	18½
14's	19
16's	19½
18's	20
20's	20½-21
22's	21½
24's	22
26's	22½
30's	23½
40's	28
50's	34

Southern high grade mule yarn:—

Cones.

10's	19
12's	19½
14's	20
16's	20½
18's	21
20's and 22's	21½-22
24's	22½

Southern frame yarn, lower grades:—

6's and 8's	17½
10's	18

Eastern cones (high grade quality):—

10's	19½
12's	20
14's	20½
16's	21¼
18's	21¾
20's and 22's	22¼-23¾

Skein yarn (mostly Southern):—

4's to 8's soft	18
10's to 12's	18½
14's to 20's	19-20
22's	20½
14/2	19½
16/2	20
20/2	22
30/2	25
40/2	29
16/3 slack	20
12/3 slack	19½
8/3 carpet	17½
8/3 slack	17½
9/4 slack	17½

Warps (Southern):—

10's to 12's	19
14's	19½
16's	20
20's to 22's	20-20½
26's	21½
14/2	20
16/2	20½
20/2	22
24/2	23
30/2	25
40/2	29

Mixed colored yarns (mock twist, half colors):—

6's to 10's	19-19½
12's to 14's	20-21
16's to 18's	21½-22

Mock Egyptian, 2c. advance over white.

Egyptian, 4c. to 5c. above best quality white.

American Cotton Yarn Exchange

COMBED and CARDED
COTTON YARNS

From Northern and Southern Mills.

American, Egyptian,
Peruvian and Sea Islands.

ARNOLD B. SANFORD, Pres. and Gen. Mgr.

OFFICES:

67 CHAUNCY STREET - - BOSTON

LINEN YARN IMPORTER.

HUGHES FAWCETT, 115 Franklin Street, NEW YORK.

Flax, Hemp and Jute Line and Tow Yarns,
For Weaving Purposes.
Linen Jacquard Harness Twines,
Fine Cotton Harness and Heddle Twines,
For Cotton, Silk, Woolen and Carpet Manufacturers.
Correspondence solicited. Samples promptly furnished.

Mercerized and Plain
Skein, Warps,
Cones, Cops,
Tubes
COTTON YARNS
426 and 428
Market St., Phila.
Theo. H. Strouse & Co.

Ballou Yarn Co.

PROVIDENCE, R. I.

Harness and Seine Twines and other Job
Gassing, Winding, etc. All Numbers.

GASSED YARN SPECIALTIES

CELEBRATED BRAND PYRAMID LACINGS

For Underwear, Overshirts and Sweaters,

JOHN CATHCART & CO.,

115 Franklin Street, NEW YORK.

LACINGS FOR OVERSHIRTS and UNDERWEAR.

Tipped and Tasseled.

Hepner & Horwitz, 80 Howard St., N. Y.

F. C. BARTON

MANUFACTURER OF LILY BRAND NARROW FABRICS
RIBBONS, TAPES, BINDINGS & NON ELASTIC WEBBINGS

54 FRANKLIN STREET, NEW YORK

Pocasset Worsted Company,

WORSTED YARNS

IN THE GRAY.

Mills at
Thornton, R. I.

Office
100 Boylston St., Boston, Mass.

CRANSTON WORSTED MILLS.

Worsted and Mohair Yarns—White or colors,
in skeins, on spools, cones, or shuttle bobbins.

Novelty Yarns—of Mohair and Worsted. We are the only manufacturers in the United States making these yarns from the raw material to finished product and making yarns only.

Genapped Yarns of all kinds. Doup Yarns. Harness Yarns. For Braids, etc.

DYERS OF YARN AND SLUBBING. BRISTOL, R. I.

French System. **B. F. BOYER CO.,** Bradford System.

MANUFACTURERS OF

WORSTED AND WOOLEN YARNS,

Office and Mill, Delaware and Cooper Streets. CAMDEN, N. J.

Woolen and Merino YARNS

Eaton Rapids Woolen Mills,

EATON RAPIDS, MICH.

EDDY & STREET,

Cotton, Woolen,

Yarns and Braids

Worsted, Spun Silk.

PROVIDENCE, R. I.

RICHARD CAMPION,

SELLING AGENT FOR

Bristol Worsted Mills,
Highland Worsted Mills,
Loridan Worsted Co.

300 Chestnut Street,
PHILADELPHIA, PA.

THE MALCOLM MILLS CO.,

MANUFACTURERS OF

FANCY YARNS and POLISHED THREADS.

Offices: 229 Chestnut St., Philadelphia.

Mills: Frankford, Pa.

KROUT & FITE MANUFACTURING CO.,

Manufacturers of

Silk, Cotton and Mercerized Narrow Fabrics

Spool Tapes a Specialty.

Telephone Connection. Office and Mill, Allegheny Ave. and Emerald St., PHILADELPHIA.

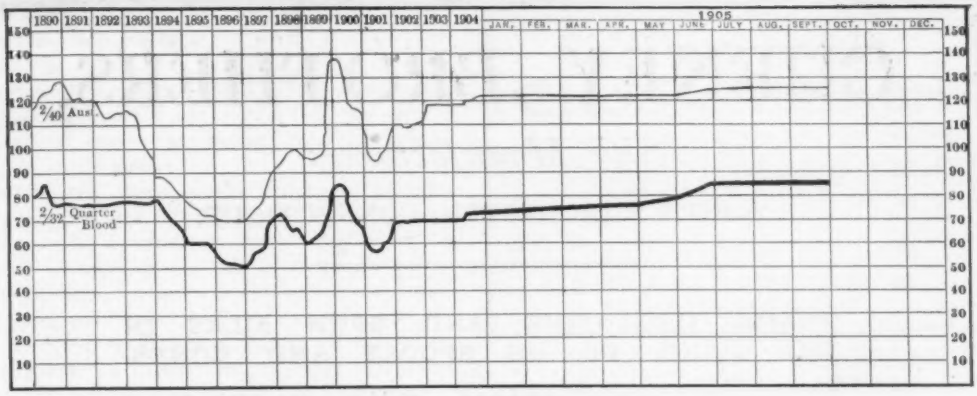


CHART SHOWING RANGES OF PRICE OF WORSTED YARNS.

Worsted Yarn.

The spinners continue busy on old contracts and all are rushed to produce the yarn ordered. Many spinners are refusing to take orders at any price for immediate delivery and those willing to book orders name February 1st as their earliest date. Some spinners have been making propositions to take orders for delivery one year from the present time. It is figured that at the present time no lower prices can be looked for. It is argued that whatever may be the price of wool, spinners are so well employed and the demand for yarn so great that lower prices are not even to be considered.

Large quantities of mixed yarn are being sold and spinners cannot keep up with the demand. We know one weaver who found fault with an excess shipment, wanted to return the yarn, and then changed his mind and decided to keep it. Between the two thoughts the yarn had been sold away from him, and much against the inclination of the weaver he was forced to return the yarn to the spinner.

Weavers who have covered state that they feel easier when orders are booked as they can take orders without fear of meeting higher prices when they want to cover. Many orders will be placed during the coming month if spinners will accept them.

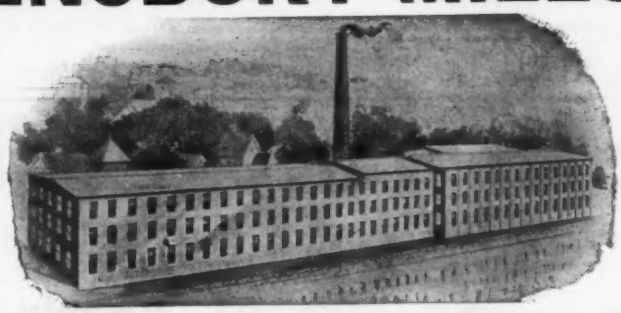
Notwithstanding the large deliveries of worsted yarn many thousand pounds of cotton yarn are being used by weavers. We know of one large concern which is using 70,000 pounds per day of cotton yarn. We hear also that mills on account of the short supply of worsted yarn have many looms stopped. Manufacturers making cloth from woolen spun yarn are shutting down their spinning and are buying worsted yarn to run their mills. Weavers have had the fear that if prices for cloth advanced foreign cloth would enter the market and thus displace much of the products of our own looms. It is said that undoubtedly on the light weight worsted cloth foreigners have been send-

QUEENSBURY MILLS WORCESTER MASS.

MOHAIR TOPS AND YARNS FOR WEAVING

LUSTRE YARNS FOR SERGE LININGS

ALPACA YARNS



SPINNERS OF MOHAIR YARNS FOR ZIBELINES

DRESS GOODS YARNS
KNITTING YARNS
WORSTED YARNS

MOHAIR

CHENEY BROTHERS,

Silk Manufacturers,

SOUTH MANCHESTER, CONNECTICUT.

TRAMS, ORGANZINE AND SPUN SILKS IN THE HANK, OR ON SPOOLS AND CONES.

SILKS FOR ELECTRICAL USES, INSULATION AND SPECIAL PURPOSES MADE TO ORDER.

KNITTING SILKS, RIBBONS AND PIECE GOODS FOR TRIMMING KNIT GOODS.

Pure Dye and Fast Colors Warranted.

WILLIAM RYLE & CO.,

Foreign and Domestic

Spun Silk Yarns and Noils.

Domestic Thrown Silk of every description. Fine Pure Dye Silks for the woolen trade a specialty. Importers of European and Asiatic Raw Silk.

54 Howard St., cor. Mercer St., NEW YORK.

SAUQUOIT SILK MFG. CO.,

INSULATING AND BRAIDING SILKS.

ORGANZINE, TRAM & HOSIERY SILKS.

Fast Dye Organzines for Woolen Manufacturers a Specialty.

Mills: Bethlehem, Pa., Phila., Pa., Scranton, Pa. New York Representatives, Wm. Ryle & Co., 54 Howard St.—Phila. Office, 4015 Clarissa St., Nicetown.—Chicago Office, 210 Monroe St.—Boston Office, 78 Chauncy St.

Crochet Lace Edgings

Spun Silk, Splicing Yarn, Mercerized Yarns, Cotton Warps, Sewing Threads, Tapes, Braids, Domets, Cambrics, Silesias. : : :

Write for Prices and Samples. **George W. Chapin** 229-231 Church St. PHILADELPHIA

ing in cloth in competition, but that on account of the specific duty on the heavy weight cloth it is impossible to import it at anywhere near a competing price. Consequently the domestic manufacturers have the market. It is said that in order to reduce cost weavers are making the heavy weight samples much lighter.

Undoubtedly next season many of the mills using worsted yarn will use a smooth finish woolen spun yarn as a substitute for worsted yarn. A number of mills during this light weight season have substituted a smooth woolen yarn for worsted yarn, and a very profitable and successful run has been the result. The weavers have very few stock goods on hand. One 150-loom mill stated that at the present time they had on hand only sixteen pieces and some goods left on hand by cancellations early in the season had been sold at a great advance over the initial price.

Of course no one expected that weavers could pay excessive advances and not advance the price of cloth in a corresponding manner, and thus it is that on all lines duplicate business will be accepted only at an advance of from 17 to 30 cents per yard, the better makes and qualities taking the highest advance. Whatever may be the results on the higher grades, on the lower grades, such as mercerized worsteds, the advance has not stopped buying in any particular. Buyers want cloth and are paying the prices asked. Those who placed large orders of course are the best off. Some ordered largely at first but the majority bought their usual supplies and must duplicate largely. Some of the weavers of the finer grades of cloth who have advanced duplicate business 30 cents per yard fear it will bring about either a hand to mouth business for the finer grades, or that those using finer cloth will substitute the cheaper grades and let the better grades go. Whatever happens, cloth manufacturers state that they must get the advance or shut down their mills. Many of the cautious mills are not over supplied with material as the present condition of affairs was not expected. The mills on mercerized worsted are keeping the market and many of them are over sold and will be unable to make final deliveries at anywhere near the time agreed.

The knitters are not busy as the price of worsted yarn has been placed beyond their reach for the time being. Many hosiery knitters are going back to the manufacture of hosiery from merino wool spun yarn. At the prices now prevailing this class of trade cannot get a new dollar for an old one. The dress goods manufacturers are picking up considerable business. Bunting has been going slowly, but an advance has been established. The

Of Two Evils, Choose Neither!

Don't use fluid oils, and oil your belts, your floors and your goods, as well as your bearings.
Don't use greases, which don't feed till the bearings grow warm, and leave a gummy residue behind, causing an increase of 25 or 30 per cent in the friction load.
Use **NON-FLUID OILS**, which don't drip like the corresponding fluid oils, nor inflate your coal bill like greases.
Our booklet tells why. May we not send it to you, with free samples to prove our claims? Better write to-day.

NEW YORK & NEW JERSEY LUBRICANT CO.,
17 Church St., New York City.

WILLIAM B. CHARLES,
Cotton Yarns,
Cotton Cloth,
Silesia, Sateens,
For the Underwear Trade.
AMSTERDAM, N. Y.

C. MOORE & CO.,
Manufacturers of
TWINES, THREADS AND YARNS,
Jacquard Harness Twines of all kind on hand and made to order.
S.W. Cor. Fifth and Market Sts., Phila.

JOSEPH M. ADAMS CO.
WOOLEN YARNS,
Carpet Backing and Rug Yarns a Specialty.
ARCOLA MILLS,
Main St., foot of Centre St., Manayunk, Philadelphia.

Knitting and Weaving YARNS.
Cones, Cops, Warps, Skeins,
Single, Double, Three-Ply, etc.
Peeler, Egyptian, Mixed Colors.
Large Assortment.
EDWARD S. HYDE,
226 CHESTNUT STREET,
Philadelphia, Pa.

Has stood the test of years in Textile Mills

WARREN'S PULLEY COVER.

It allows belts to run slack without slipping. Saves power, belts and bearings. Any careful man can apply it. Is very economical and durable.

Sufficient for 40 sq. ft., $5; 125 sq. ft., $12.
If your supply house does not sell it, order direct.

The Warren Co., Mfrs., 192 Orleans Street, Chicago, Ill.

G. M. BLAISDELL, Pres. and Treas. G. A. BLAISDELL, Vice-Pres. and Secy.
Established 1860—Incorporated 1893.

THE S. BLAISDELL, JR., CO.,
COTTON, EGYPTIAN PERUVIAN
American Long Staple a Specialty. Shipments direct to mill from Egypt, Peru and all American Southern Points.
CHICOPEE, MASS.
Cotton Waste Purchased on Yearly Contract from Mills.

You Save Enough Insurance to Pay for the Equipment.

So it costs you NOTHING to have the AMERICAN WATCHMAN'S CLOCK. Fully approved by all insurance companies. We equip factories with Fire Alarms, Signals, etc., also Employee's Time Recorders, and Telephone Systems. Electric Time System consists of Master Regulator in office with secondary electric clocks throughout the mill, insuring accurate time. Send for particulars.
Pettes & Randall Co., 150 Nassau St., New York

YARNS Solis, Boston.
77
SUMMER STREET.
ANDREW J. SOLIS, Jr. & CO.

HOFFMAN, DeWITT & McDONOUGH,
Manufacturers of
Diamond Stay Bindings TRADE MARK
Tapes, Webbing and Bindings.
COTTMAN and G STS., PHILADELPHIA
Ryer's Station, P. & R. R. R.
Bell Telephone, 203 Cheltenham.

combers are not busy notwithstanding the activity of worsted yarn. The business at this time is all with the men's wear worsted weavers.

Prices are unchanged.

2/40s Australian	1.28
2/40s Delaine	1.23
2/36s 1/4 to 3/8 Blood	95-97½
2/32s 1/4 Blood	84
2/20s 1/4 Blood	75-82

Woolen Yarn.

Spinners are not busy as a rule, but have enough work to keep them going comfortably. All are looking forward to the heavy weight business in expectation of a good run, as undoubtedly much woolen yarn will be used as a substitute for worsted yarn. Many of the mills making cloth from woolen yarn are unable to get orders at any price and are either running their looms on worsted cloth or cotton worsteds, buying their yarn supply and thereby shutting down their woolen spinning, or are making a smooth finished cloth in imitation of worsted. There are mills with this line of cloth on the market which have sold up their entire productions. Then again there are mills which generally use worsted yarn that have not used a pound, but have had yarn spun outside in large quantities and are substituting it for worsted yarn. It is predicted that before long this state of affairs will improve and that the heavy weight season will require all the woolen yarn that can be produced.

Many of the worsted mills are putting out feelers for machinery space and getting quotations for commission spinning. The makers of sale yarn are not getting the business and say that the present season is the worst they have experienced in many years.

The hosiery manufacturers, because of the high price of worsted yarn, are swinging around to merino yarn as the only means of producing hosiery which can be sold at a profit.

Cotton, Wool, Flax and Jute Waste.
Sea Island, Egptian and Peeler Comber. Linters.
Worsted, Woolen and Mercerized Cotton Yarn.

James E. Daly
Textile Fibres and Yarn
Room 406, Textile Building
72 Leonard Street
NEW YORK

Worsted, Mohair, Camels Hair, Silk, Flax and Ramie Noils.
Slubbing, Roving Rings and Threads.
Garnetted, Worsted, Woolen, Cotton and Silk Stocks.

SPUN SILK, SCHAPPE, TUSSAH } Yarns in Stock.

H. de VEER,
260 West Broadway,
(Wool Exchange Building,)
NEW YORK.

TUSSAH WASTE,
SILK NOILS,
DOUPPION.

Certain knitters of eiderdown are busy, although the different grades have been lowered to meet the advanced price of wool. It is said that this is an opportune time to buy yarn as the raw material is very cheap compared with the price of material fit for combing. It is noticed that the makers of smooth finished underwear have the best of the business. The same can be said of underwear made from the finest grades such as Australian lamb's wool. Yarns of all grades have advanced materially and knitters have been obliged to advance the price of garments and are now awaiting the result. Buyers of underwear must soon come on the market and buy in good quantities. The difficulty which they must face will be backward deliveries.

Much Australian thread waste is being sold and the other product which is being offered will greatly relieve the high priced situation of wool. Buying by the knitting trade is in spots, some evidently doing better than others. The market on all classes of yarn from fine foreign wool is stationary; on yarn from domestic stock the advance has been checked and the trade is rather quiet.

Rag and Shoddy Market.

Firm prices and a small volume of business are the features of the rag and shoddy market. The demand for shoddy would ordinarily be strong with wool on its present basis of 70 cents for fine medium territory, but the popularity of worsted effects has upset all calculations on this line. The call is for stock that will take a worsted finish and it is here that rag shoddy is found wanting. The manufacturer of goods has been forced to use cotton instead and as a result rags and shoddy are neglected.

In spite of the slack demand prices have been well maintained and this is ascribed to the shrewdness of the rag dealers, who for months have discouraged collectors. What is ordinarily meant by the "supply" of rags is the quantity collected. The real supply, however, is an unknown quantity whose limits collectors never reach. Rags thus differ from other textile materials by the fact that the market supply is under the absolute control of one branch of the trade. For this reason the explanation of the present firm market in the face of a weak demand for shoddy is entirely logical.

Whether the present rather anomalous situation will continue throughout the heavy weight season depends upon the continuance of the popularity of worsted effects, which shows no signs of weakening.

SHODDIES AND EXTRACTS.

White yarn, best all wool	44-47
White knit, all wool, best, fine	35-40
White knit, No. 2	30-35
Light yarn, extra fine	30-35
New pure indigo blue	28-30

WILLIAM B. CHARLES,

Cotton and Cotton Wastes

Amsterdam, N. Y., U. S. A.

COTTON YARNS.

Contracts made with Cotton and Woolen Mills for Yearly Waste Production. Correspondence solicited. Shepperson's Code, 1878. Cable Address "Charles."

SHODDY WM. H. H. SLACK & BRO., Springfield, Vt.

Carbonized Stock a Specialty. **FLOCKS**

M. B. SCHWAB, Pres. H. RAWITSER, Treas.
ED. GLUECK, Sec. and Gen. Mgr.

RIVERDALE WOOLEN CO., MANUFACTURERS OF

.. Shoddies ..

Of every description. Capacity 7,000,000 pounds per annum. Custom Carbonizing and Garnetting a Speciality.

New York Office. 140 DUANE STREET. RIVERDALE, NORTHBRIDGE, MASS.

Merino.

Fine light, all wool, No. 1	24-27
Medium light, all wool, No. 1	15-17
Medium light, all wool, No. 2	
Fine black, all wool	25-27
Fine dark, all wool, best grade	22-25
Medium dark, all wool, No. 1	18-20
Medium dark, all wool, No. 2	15-16
Red knit stock, strictly all wool	20-22
Red flannel, all wool	20-22
Dark blue for hosiery, strictly all wool, No. 1	20-22
Dark blue for hosiery, not all wool, No. 2	15-18

DELAINE EXTRACTS.

Light	18-20
Medium black	15-16½

WOOLEN RAGS.

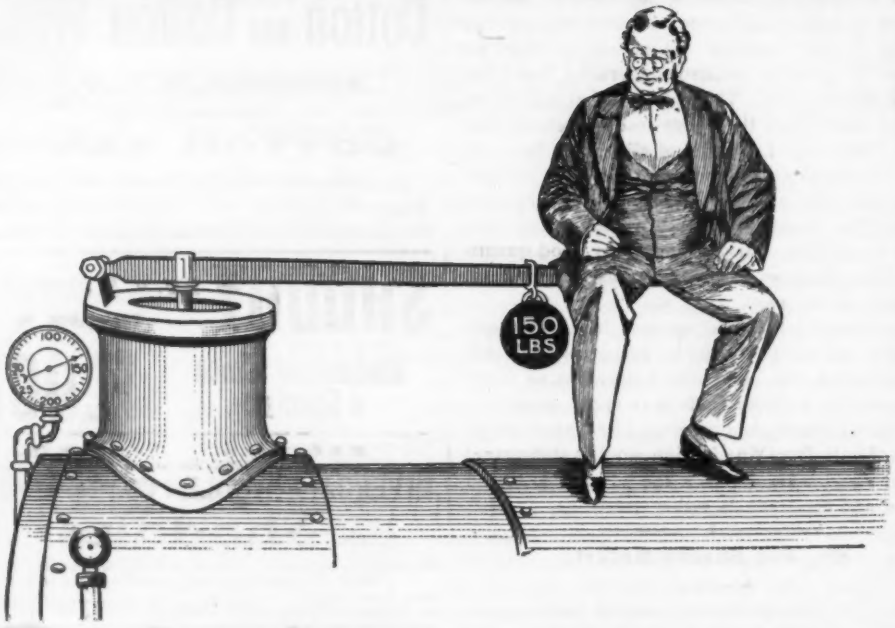
Fancy colors	20-26
Fine merchant tailors, all colors	8½-9½
Choice light colors	12-13
Browns	12-13
Blacks	8-8½
Fine blues, plain	9-10
Fine dark	9-10
Medium dark	6-7

Worsteds.

Blue	16-18
Black	20-22

Serges.

New black	16-18
New blue	15-17



Don't sit on your own Safety Valve!

It is both dangerous and expensive. Boiler explosions have frequently wrecked the work of generations in building up a plant and a reputation. As an up-to-date manufacturer YOU eagerly accept every mechanical improvement that simplifies production or decreases its cost. Your steam plant is the hub of your productive universe. You should know for a certainty that it is safe and efficient. More than that, you should

Guarantee Your Profits and Income

BOILER INSURANCE IN THE

Casualty Company of America

will assure the one and pay you the other. No other boiler insurance guarantees you against loss of income due to explosion. No other company has more thorough and careful inspections. No other company has behind it more conservative or responsible men than the

Casualty Company of America

Insures and inspects the greatest single boiler underwriting risk in the world.

Home Office: 52-54 William Street - - NEW YORK

Ask your broker or write the home office direct for sample policy and full information.

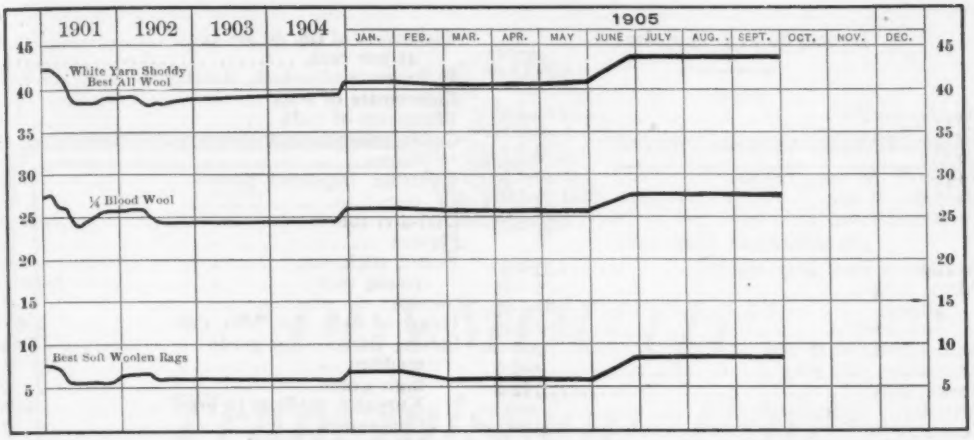


CHART SHOWING RANGE OF PRICES OF SHODDY, RAGS AND NOIL.

Flannels.

New scarlet	19-20
New blue	15-16
Cloakings	3-4

SOFTS AND KNIT STOCK.

Soft woolens, best	9-10
Old white flannels	20-22
White flannels, No. 2	11-12
Old red flannels	12-13
Light blue flannels	7½-8½
Old blue flannels	6¼-7
Fine worsted, new black	21-22
Old plaids	5-7½
White stockings	20-22
White hood stock	20-22
Clear hoods	9-10
Red stockings	12-13
Blue stockings	8½-9
Fancy stockings, No. 1	9½-11
Gray stockings	9½-10½
Black stockings	10½-11½
Knit stock comforters	7-8
Red knit	12-13
Light gray knit	9-10
New light fancies	14-15
New fancies	11-12

Merinos.

Light, fine	16-17
Light, coarse	7½-8
Fine, dark	12-13
Coarse, dark	7-7½
Blue	11-12
Blue—seamed	
Black—seamed	15-16
New black	18-20
Small	4-5
Bunting	7-10

FLOCKS.

Shear, fine white, all wool	10-12
Fine indigo blue, all wool	7-8
Fine black, and blue, all wool	6-7
Fine dark, all wool	2½-4
Gig, fine, all wool	2-3
No. 1 black, all wool cut	6-10

COTTON WASTE.

No. 1 Spinners	10-10¼
No. 1 Machine	6¼-6½
No. 2 Machine	5-5½
Machine Cop	9-9½
No. 1 Cop	8¾-9
No. 1 Card	7½-8½
No. 2 Card	6-6½
No. 1 Oily Card	5½-6
No. 2 Oily Card	4-4½
Peeler Combing	10-10¼
Egyptian Combing	10-10¼
No. 1 Linters	5½-6
No. 2 Linters	4½-5
White Clips	4½-5
Colored Clips	1½-2¼

The "Simplex" Tables

Comprising

Comparative Yarn Tables, showing the equivalent sizes of different systems of Numbering Yarn and Different Standards.

Reed Tables

Weight of Yarn per Yard of Cloth Tables.

Knitting Machine Gauges. Yarn Sizes for Knitting Machines. Sizes for Underwear and Hosiery.

Breaking Strength Table of American Cotton Warp Yarns.

Compiled by the

TEXTILE WORLD RECORD

Price 50 Cents

LORD & NAGLE CO., Publishers

299 Devonshire Street, Boston, Mass.

Dyestuffs and Chemicals.

Acids.

Acetic, 100 lbs.	2.60-4.05
Citric, domestic	38-38½
Oxalic	4.78-5.10
Sulphuric, 60 deg., 100 lbs.	1.10-1.30
Muriatic, 18 deg.	1.50-1.60
Tartaric crystals	29-29½

Miscellaneous Chemicals.

Acetate of lime, gray, 100 lbs.	2.35-2.40
Alum, lump	1.75-1.85
ground	1.85-1.95
powdered	3.00-3.25
Aqua ammonia, 16 deg.	3¾-4
Ammoniac, sal., gray	5¾-6
Borax, bbls.	7¾-8
Brimstone, crude, foreign ton	22.00
Copperas	52½-65
Cream tartar, crystals	23½-23¾
Fuller's earth, lump, 100 lbs.	80-85
powdered	80-85
Glauber's salt	45-50
Potash, chlorate, crystals	8¼-8¾
powdered	8⅜-8⅞
carbonate	4-4¾
Soda ash, carbonate, 48 per cent	1.20-1.30
high test	1.00-1.25
Soda, bicarbonate, English	
American	1.30-1.70
Soda, caustic, domestic, 60 per cent.	1.85-1.90
Sal. English	85-90
Sal. American	60-70
Sulphate, alumina	90-1¾
Vitriol, blue	5¼-5½

Dyestuffs.

Acetate of soda	4¼-4½
Acid, picric, best crystals	22-28
tannic, commercial	35-37
Albumen, egg	48-65
blood	20-27
Alizarine, red	15½-16½
Aniline oil	10-10¼
salt crystals	8¾-9
Antimony salt, 65 per cent.	14½-15
Bichloride of tin, 50 per cent.	10
45 per cent.	9½
Bichromate of potash, American	8½-8¾
Bichromate of soda	6½-6¾
Bisulphate of soda	80-1⅜
Cutch, mat	4½-6
boxes	5-7
Dextrine, imported potato	6½-7½
corn	2.55-2¾
Divi-divi ton	35.00-40.00
Flavine	23-40
Fustic, stick, ton	18-20
young root	31.00-35.00
Gambier	4¼-4½
Hypo. of soda, Am. bbls. cwt.	1.40-1.50
Indigo, Bengal, low grade	52½-55
medium	60-65
high grade	75-85
Kurpah's, medium to good	47½-60
Gautemala	35-70
Manila	43-45
Madras	42-45
J. (Synthetic)	18-20
Indigotine	95-1.80
Logwood, stick, ton	15.00-19.00
roots	14.00-16.00
Madder, Dutch	8½-10
Muriate of tin, 36 degrees	9-9¼
52 degrees	15-15¼
Nitrate of iron, commercial	1¼-1½
Nutgalls, blue Aleppo	17-18
Persian berries	
Phosphate of soda	1.90-2¼
Prussiate of potash, yellow	14
Quercitron, ton	18.00-20.00
Starch, corn, pearl, bbls.	2.10
corn, pearl, bags	1.95
potato	3½-4
rice	6½-7½
wheat	5-6
Stannate of soda	10-20
Sumac, Sicily, No. 1, ton	45.00-46.00
Sicily, No. 2, ton	42.00-43.00
Tapioca flour	2½-3
Tin crystals	21-22½
Tumeric, Madras	4½-4¾
Zinc dust	5¼-6

GEISENHEIMER & CO.
189 Front Street, NEW YORK.
K. OEHLER'S
Branch Offices:
19 Pearl Street, Boston, Mass.
31 So. Front Street, Phila., Pa.

Aniline Salt and Oil.
Aniline Colors.
DYESTUFFS,
DYEWOOD EXTRACTS.

BEFORE CLOSING CONTRACTS FOR
STARCH, GUMS, DEXTRINE
WRITE FOR QUOTATIONS AND SAMPLES TO
STANDARD STARCH COMPANY,
439 WEST 43RD STREET, NEW YORK.

"PLYMOUTH" Transmission Rope

was the first practical rope for this purpose to be made in this country.

Since its introduction transmission by means of ropes has steadily grown in favor, and the qualities of efficiency and economy have won for it a place of high regard among mill owners and engineers.

There is hardly a textile mill in the country that does not offer some opportunity for the use of rope drives and we gladly place at their disposal the results of our long experience in this line.

If you have transmission problems of any kind, write us, and your questions will have the careful attention of our Engineering department.

Our book on "Rope Driving" will be valuable to anyone at all interested in the subject. Write for it.

DO YOU USE BALING ROPE OR MANILA ROPE FOR ANY PURPOSE WHATEVER? IF SO, IT WILL PAY YOU TO GET ACQUAINTED WITH "PLYMOUTH" GOODS.

PLYMOUTH CORDAGE CO.,

383 Court Street,

North Plymouth, Mass.

New Bedford Textile School

Day and Evening Instruction in . . .

PICKING, CARDING, COMBING AND SPINNING, WARP PREPARATION AND WEAVING, DESIGNING, KNITTING CHEMISTRY AND DYEING.

CATALOGUE ON APPLICATION.

Address

New Bedford Textile School

NEW BEDFORD, MASS.

When Traveling

between

BOSTON and NEW YORK

ask for tickets via the "Springfield Line," Boston & Albany R. R., which affords the following excellent train service, leaving Boston

9.00 a. m. "DAY EXPRESS," Buffet Parlor Cars and Day Coaches, Boston to New York without change. Due New York 3.15 p. m.

12 O'CLOCK "LIMITED," Pullman Parlor Cars and Day Coaches, Boston to New York, without change. Dining Car, Boston to New Haven. Due New York 5.45 p. m.

4 O'CLOCK "LIMITED," New Parlor Cars and Vestibuled Day Coaches, Boston to New York without change. Dining Car, Springfield to New York. Due New York 9.51 p. m.

11.15 p. m. "NIGHT EXPRESS," Pullman Sleeping Cars and Day Coaches, Boston to New York, without change. Due New York 6.48 a. m. Similar service returning from New York on the same schedules.

Send for copy of "Springfield Line" folder and see what the Boston Journal has to say of the new parlor cars on the "4 o'clock Limited."

If you are interested in a trip to the West, you should have a copy of "Westbound" folder, covering schedules and train service via the New York Central Lines.

A. S. HANSON, Gen. Pass. Agt., Boston.

PHILADELPHIA

Textile School

TWENTY-SECOND YEAR.

Oldest in America . . .
Most Complete in the World.

Endorsed by the leading Educators and Manufacturers.

Cotton, Wool, Worsted and Silk

Instruction given in Designing, Weaving, Carding, Spinning, Chemistry, Dyeing and Finishing.

1905-6.

Day Classes open October 2nd, 1905.
Evening Classes open October 9th, 1905.

Special Courses in Textile Chemistry and Dyeing.

For illustrated Year book and other information, address

E. W. France, Director, BROAD and PINE STS., PHILADELPHIA.

COTTON MILLS

and all kinds of textile industries would be a great success at a number of cities and towns in the excellent cotton growing sections of the South and Southwest, tributary to the

FRISCO SYSTEM

First-class inducements, such as free sites, bonuses, subscriptions to stock, etc., will be given by a number of cities and towns to secure this class of industry. It is a well-known fact that cotton grown in Indian Territorry and Oklahoma is equal to the very best, owing to its long staple and superior quality. Natural gas in abundance is also available in a number of sections and could be utilized in running cotton and knitting mill machinery.

Send for copy of "Opportunities" giving full information relative to openings of all kinds of industries, factories, etc.

M. SCHULTER,
Industrial Commissioner
FRISCO BUILDING, ST. LOUIS.

FOSTER SUPERHEATERS

Increase Efficiency and Reduce Cost of Operation.

Power Specialty Company,

BOSTON: 10 Post Office Square. **NEW YORK: 111 Broadway**

The "Being Able"

"The Lathe that runs and runs and runs."

to handle every Lathe-job, has put this

"DOUBLE-SPINDLE"

in all the prominent Textile Mill Repair-shops.

And where the argument counts big is that it don't cost but half the big price of big Lathes.

We're waiting for the word to send you book.

McCabe's "New Style" 26-48 inch "Double-Spindle" Lathe.

J. J. McCABE,

14 DEY STREET, **NEW YORK**

CLOTH CUTTING MACHINERY

Adapted to All Textiles;—COTTONS, SILKS, LINENS, WOOLENS.

MODEL B—A CLOTH SPLITTER.

Made by

JAMES A. CAMERON,

Fourth Avenue and Baltic St.,

BROOKLYN, N. Y.

DEAR SIR:—

Every manufacturer has his own particular problems. If yours happen to be in any way related to Cloth Cutting, let me help you solve them. That is my business.

Perhaps your methods are perfect, perhaps not.

You can know all I know for the asking.

Very respectfully yours,

JAMES A. CAMERON.

AMERICAN DIRECTORY OF THE KNITTING TRADE

OF THE UNITED STATES AND CANADA.

Compiled by TEXTILE WORLD RECORD. (Twenty-second year of publication.)

This Directory contains a most complete report of the knitting mills, giving names of officers, class of goods made, number of knitting machines, nnmber employed, how the goods are sold, names of buyers, kind of yarn bought, whether dye or finish.

In dry goods section is a full list of manufacturers' selling agents and commission merchants handling knit goods, giving the names of the mills for which they sell and the man in charge of the knit goods department.

There are also complete lists of jobbers, department stores and large retail estalishments buying knit goods.

The book is of convenient size for the pocket, well printed and handsomely bound.

PRICE, $1.00

LORD & NAGLE COMPANY, 299 Dvevonshire St., Boston

123 Liberty Street, New York. **425 Walnut Street, Philadelphia.**

The WM. H. LORIMER'S SONS CO.,

Manufacturers of

MERCERIZED YARNS

FOR ALL PURPOSES.

MERCERIZERS AND DYERS.

New York Office:
Room 911 New York Life Building,
346 Broadway.

Ontario and Lawrence Sts.,
PHILADELPHIA, PA.

PROVIDENCE MILLS COMPANY,

55th AND GIRARD AVE., PHILADELPHIA, PA.

BLEACHERS AND FINISHERS

Correspondence Solicited. OF ALL CLASSES OF LINEN GOODS. Toweling and Damasks a Specialty. Telephone Connection.

Do you Know THAT **JOHN F. DAVIDSON**

Does the Best Bleaching at the Most Reasonable Rates?

TURKISH TOWELS, SKEIN YARN, TAPE, UNDERWEAR.

Send us a sample, we will show results and quote prices.

2560-62-64 N. Third St., Philadelphia.

R. GREENWOOD & BAULT,

DYERS, BLEACHERS AND **MERCERIZERS**

OF COTTON WARPS AND SKEIN YARNS.

Globe Bleach and Dye Works,
Oxford and Worth Sts., Frankford. Pa.

140 Chestnut Street, PHILADELPHIA.

We are Dyers of all kinds of YARNS Cotton AND Warps

We are sure we can give you better work and better service that you can get elsewhere. A trial will convince.

T. BROPHY'S SONS, Jasper St., above Clearfield St., - PHILADELPHIA, PA.

WE DO BLEACHING and DYEING

ESPECIALLY FOR THE **KNIT GOODS TRADE**

YARNS BLEACHED AND DYED (delivered on cones)
CONE WINDING FOR THE TRADE.

Schuylkill Haven Bleach and Dye Works, SAMUEL ROWLAND, **Schuylkill Haven, Pa.**

N. B. Bleached Finishing Yarns on Cones for Underwear, always in Stock.

INCRAHAMVILLE DYE WORKS,

Dyers and Bleachers of Cotton Yarns in long or Short Chain Warps and Skein, in FAST COLORS, FOR BLEACHING PURPOSES, Cross Dyeing, Ginghams, Etc.

Also Dyers of Turkey Reds and Indigo Blues for all purposes in either Warp or Skein.

Telephone. PAWTUCKET, R. I.

FIRTH & FOSTER CO.

Dyers and Finishers

York, Emerald and Adams Sts., Philadelphia, Pa.

New York Office, Silk Exchange Bldg., Cor. Broadway and Broome Sts.

Dyeing and Finishing of Piece Goods Exclusively, such as Wool Armures, Prunellas, Satins and Henriettas. Panamas, Poplins, Serges and Cheviots. Mohairs, Bradford Finish, in Fancy and Solid Colorings. Also Suitings and Cloakings.
Specialty in the Treating of Silk and Wool Fabrics, such as Eoliennes, Crepes and Henriettas and all high class wool tissues like Batiste, Voiles and Foules. Also, Cotton and Wool Goods, Mohair Linings and Lastings.

SPECIAL ATTENTION IS GIVEN TO THE REDYEING OF ABOVE

RICHARDSON BROTHERS

542 PEARL STREET, NEW YORK

PAPER AND TWINE MERCHANTS

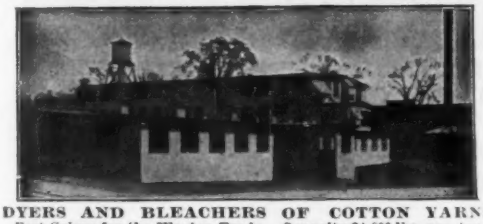
FOR FINISHERS OF TEXTILE FABRICS

"ROYAL" PRESS PAPERS

Established 1881.

Peter B. McManus, Prest. and Treas. Peter B. McManus, Jr., Asst. Treas. Edw. J. McCrughey, Secy.

HOME BLEACH and DYE WORKS, Inc.,



DYERS AND BLEACHERS OF COTTON YARNS

Fast Colors for the Woolen Trade. Capacity 20,000 lbs. per day

Office and Works, Pawtucket, R. I.

Pawtucket Dyeing and Bleaching Co.

Bleachers and Dyers of COTTON YARNS and STOCKINET

Office with Blodgett & Orswell Co., Manufacturers of Glazed Yarns.

232 Front St., Pawtucket, R. I.

THE PEERLESS COMPANY,

Dyers of Skein Silk

FOR ALL TEXTILE PURPOSES

Willard and Jasper Sts., Philadelphia.

Pure Dye and Weighted. Bright and Souple.
Dyers of Peerless Black on Artificial Silk.

Thomas Hulme. Edward A. Schneider.

THE FAIRHILL BLEACHERY

Bleachers of Cotton Goods

Yarns, Tapes, Webbing and Piece Goods

Rear 2803-5-7 Fairhill Street, Philadelphia, Pa.

MARYLAND BLEACH AND DYE WORKS,

BALTIMORE, MD.

BLEACHING, DYEING AND MERCERIZING

of all grades of Cotton Yarn.

QUARANTEED FAST COLORS.

Direct, Sulphur and Oxidized Black, Fast and Stainless Colors on Merino Yarn. Fast Milling and Alizarine Colors on Wool. TUBING—Universal and Foster—CONING.

Prompt and Careful Attention Given to All Orders.

Western Mills!!

DO YOU WANT

Quick Service?

Besides saving freight you do away with the annoyance of long waiting to which you are subjected when you send your goods east. We guarantee work on 24-48 hours' notice. Ship us a bale for trial, or write for details.

WE DYE

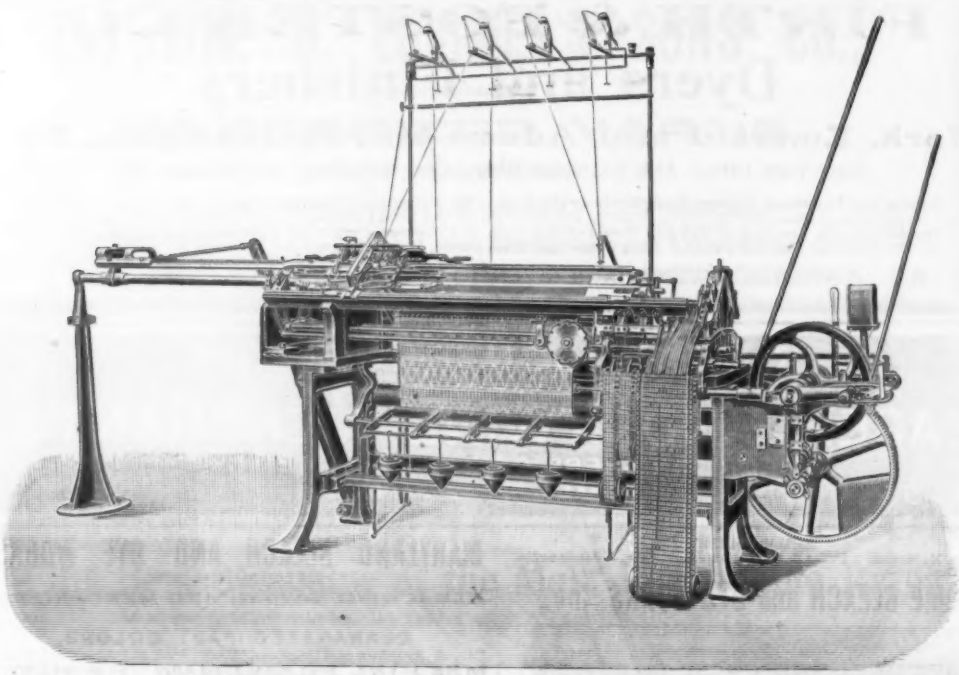
COTTON YARN
MERCERIZED COTTON
KNIT GOODS

In Fast Black and Colors.

Western Textile Fibre Co.,

Root and LaSalle Sts., Chicago, Ill.

(Largest Bleachery and Dye House West of Philadelphia.)



MODEL K.M. DOUBLE MECHANIK FULL AUTOMATIC JACQUARD NOPPEN POWER KNITTING MACHINE, FOR ANY ARTICLE IN FANCY KNIT GOODS.

There is positively no machine in the market for Fancy Knit Goods that can be so easily and quickly operated as a

Bach Single or Double

Mechanik Jacquard Noppen Machine

either by Hand or Power.

Positively no machine with so much variety of patterns. Any knitter who ever handled a BACH NOPPEN MACHINE can prove it.

MAX GUENTHER,

Sole Agent for the United States and Canada for

Bach Knitting Machines.

In our Show Room, 531 12th Ave., Newark, N. J.,

we will prove what we say about our machines to interested parties. Plain Knitting Machines, same proof, either hand or power.

A. KLIPSTEIN & CO.

Dyestuffs and Chemicals

Fast Colors for Wool and Cotton.
Full Line of Direct Cotton Colors.

THIOPHENOL BLACK T EXTRA and 2 B EXTRA.
PYROGEN BLUE R . . . .
PYROGEN INDIGO. . . . .

} Direct Sulphur Colors, Faster than Indigo, to light and Washing.

Chrome Fast Blacks, Blues, Browns and Yellows.
Acid Benzyl Blue, Violet Green and Black.

Headquarters for Caustic Potash 90%. Carbonate of Potash. Chlorate of Potash and Soda. Tannic Acid. Bleaching Powder.

122 Pearl Street, .. NEW YORK

BRANCHES

Boston Providence Philadelphia Chicago Hamilton and Montreal, Canada

SOLE AGENTS FOR

The Society of Chemical Industry, Basle, Switzerland.

H. A. Metz & Co.,

122 Hudson Street,
NEW YORK, N. Y.

INDIGO VAT M L B I for Wool
INDIGO VAT M L B II 20% } for Cotton
INDIGO VAT M L B III 25% }

By the use of these vats, the dyeing of indigo upon wool and cotton becomes as simple as dyeing with acid wool colors or direct dyeing cotton colors and the results are considerably cheaper than those produced by ordinary dyeing methods.

Samples and information furnished upon application.

BRANCHES:

Boston, Mass.	Charlotte, N. C.	Montreal, Canada.
Philadelphia, Pa.	Atlanta, Ga.	Toronto, Canada.
Providence, R. I	Chicago, Ill.	Hamburg, Germany.
	San Francisco, Cal.	

Laboratories: NEWARK, N. J.

Castor Oil our own make and Castor Oil Products. Unsurpassed in quality. They are the standards.

BOSSON & LANE,

MANUFACTURERS

ALIZARINE ASSISTANT
TURKEY RED OIL
SOLUBLE OILS
OLEINE

B. & L. ANTI-CHLORINE (ultra bleaching process)
OLO SOFFENE (superior cotton softener)
BI-SULPHITE OF SODA
SIZING AND FINISHING COMPOUNDS

Works and Main Office, ATLANTIC, MASS. (Suburb of Boston.)

Farbenfabriken of Elberfeld Co.,

40 Stone Street, New York.

BOSTON. PHILADELPHIA. CHICAGO. CHARLOTTE, N. C.

AN EXCELLENT SUBSTITUTE FOR INDIGO ON COTTON IS

Katigen Indigo

(PATENTED.)

IMPORTERS OF

ALIZARINE, ANILINE COLORS

AND

DYESTUFFS.

AMERICAN SOAP AND WASHOLINE CO.

Textile, Laundry and Powdered

SOAPS

140-180 Central Avenue,

COHOES, N. Y.

All Soaps Guaranteed Pure and Unadulterated.

F. E. ATTEAUX & CO.,

BOSTON, MASS.

Sole Agents for the

TREMLEY BRAND

Sulphide of Sodium

Purest and Best Made.

Safest to use with the Sulphur Colors.

Berlin Aniline Works

Main Office, 213-215 WATER ST., NEW YORK CITY

BRANCHES
Boston, Philadelphia, Chicago
Charlotte, Cincinnati

SPECIALTIES

Sulphur Blacks, Sulphur Blues, Sulphur Browns, Sulphur Greens, Sulphur Yellows, Indocyanines, Nerols
Metachrome Colors
Zambesi Black V and 2G

Manufacturers and Importers of

Aniline and Alizarine COLORS

CEICY ANILINE & EXTRACT COMPANY

69 BARCLAY ST., NEW YORK

Boston Providence Philadelphia Atlanta Chicago Toronto

ANILINE COLORS, ECLIPSE SULPHUR COLORS

Dyewood and Sumac Extracts, Fast Print Colors and Specialties

"Absolutely Safe and Reliable. Ask Your Friends."

NO GUESSWORK IN A CALDWELL TANK

One reason why our tanks do not leak, give no trouble and need no watching is because every part is made by experts who have had years of experience. We can tell you other reasons.

Write for Catalogue and Price List.

W. E. CALDWELL CO.
Louisville, Ky.

DYE STICKS

Drying and Sulphur House Poles of Natural Round Water Grown Cedar for Cotton, Wool, etc. Special Hardwoods in Standard No. 1 and "Selects" without knots, grades, for Silk Dyeing. Manufactured by, prices and all information from

E. M. HAEDRICH,
601 Mariner and Merchant Bldg., ... Philadelphia.

THE AMERICAN CHEMICAL CO.

MANUFACTURERS OF

SODA

Main Office and Works, 640, 642, 644, 646 CARR ST., and C. H. & D. R. R. Cincinnati, Ohio.

Soda Ash in all Commercial Tests.
Caustic Soda, All Tests in Iron Drums in Solid Form and Ground in Barrels and Kegs.
Prime Quality Sal Soda Crystals for Wool Soap and Scouring and for Mercerizing Cotton, Bleaching, Dyeing, Etc. Also for Silk Makers, etc.
Glauber's Salt. Silicate of Soda. Write for prices, etc.

ROCK MAPLE ROLL LOGS

For BLEACHING, DYEING and PRINTING PURPOSES

All consignments made direct from Adirondack woods

GEORGE E. HARTWELL, - Northville, N. Y.

ARTHUR FAWELL

Woolen and Worsted

YARN DYER

Nos. 110 and 112 Turner St., Phila.

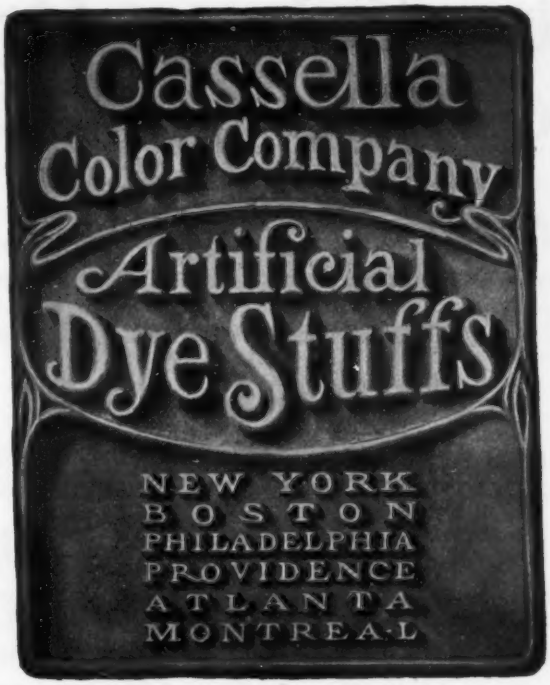
E. M. THAYER & CO
411 ATLANTIC AVE
BOSTON
MASS

—Importers and Manufacturers of—

Cotton Softeners

Sumac Extract

ANILINE and ALIZARINE COLORS
EXTRACTS and CHEMICALS


Cassella
Color Company
Artificial
Dye Stuffs
NEW YORK
BOSTON
PHILADELPHIA
PROVIDENCE
ATLANTA
MONTREAL

PEROXIDE OF SODIUM
BLEACHES
WHITE
WITHOUT
WEAKENING
THE ROESSLER & HASSLACHER
CHEMICAL CO.
NEW YORK

The Solvay Process Company,

SYRACUSE, N. Y. and DETROIT, MICH.,

MANUFACTURERS OF

SODA ASH In all Commercial Tests.

CAUSTIC SODA All Tests.

Mono-Hydrate Crystals, Snow Flake Crystals,

For Wool Soap and Scouring. For Mercerizing Cotton, Bleaching, Dyeing, etc. For Silk Makers, etc.

Sole Agents, WING & EVANS, 22 William St., N. Y.

Coal Tar Benzols and Naphthas

FOR CLEANING SILKS AND WOOLENS.

A powerful solvent leaving no stain or odor. Samples and prices on application.

BARRETT MFG. CO., Chemical Dep't, PHILADELPHIA, PA.

COPPER

Printing Rollers
Singe Plates
and Sheets

Taunton-New Bedford Copper Co.

New Bedford, Mass.

Our Guarantee:

Superior Quality. *Prompt Shipments.*

Copper Printing Rollers

Singe Plates and Sheets

Second to None in Quality and Finish.

ROME METAL CO., Rome, N. Y.

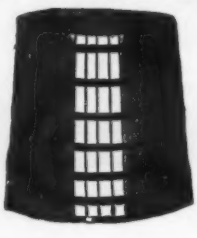
THE CYPRESS LUMBER CO.

TWO BIG FACTORIES.

TANKS

NORTHERN
Boston,
Mass.

Write Nearest



TANKS

SOUTHERN
Apalachicola,
Florida.

Write Nearest

C. Bischoff & Co.,

88 Park Place, NEW YORK.

BRANCHES:
139 S. Front St., Philadelphia.
124-126 Purchase St., Boston.
196 Michigan St., Chicago.
10 Weybosset St., Providence.
416 St. Paul St., Montreal.

PYROL COLORS FOR COTTON

of every shade and description, absolutely fast to sunlight, fulling, acids, etc.

Domingo Alizarine and Domingo Chrome Colors for Wool,

dyeing either after the one bath method absolutely fast, or on chrome bottom.

KALLE & CO.,

Established 1863.

MANUFACTURERS OF

ANILINE COLORS

NEW YORK

BOSTON PHILADELPHIA

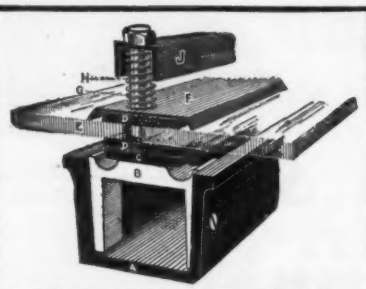
Autogene Black

A NEW DIRECT DYEING
Sulphur Black for Cotton

Fast to Light, Air, Alkali, Acid and Strong Soaping. Requiring No Fixing with Metallic Salts nor Atmospheric Ageing.

WALTER F. SYKES & CO.,

BOSTON, 396 Atlantic Ave. NEW YORK, 85 Water St. SYKES & HALL, 132 Chestnut St., Philadelphia.



A. Steel Supporting Bar
B. Malleable Iron Bridge
C. Flat Iron
D. Felt
E. Glass
F. Copper Sheet Cap
G. Coil Galv. Brass Spring
H. Galv. Brass Stud
J. Bridge (for walking on skylight)

The "Anti-Pluvius" Skylight

Permanently impervious against rain, snow, sleet or dust, without putty or cement. Bridge arrangement for walking on the skylight without contact with or pressure on the glass. The best construction on the market. Scientific principle, strong, durable, reasonable cost.

Manufactured and Erected by

THE G. DROUVÉ CO.

BRIDGEPORT, CONN.

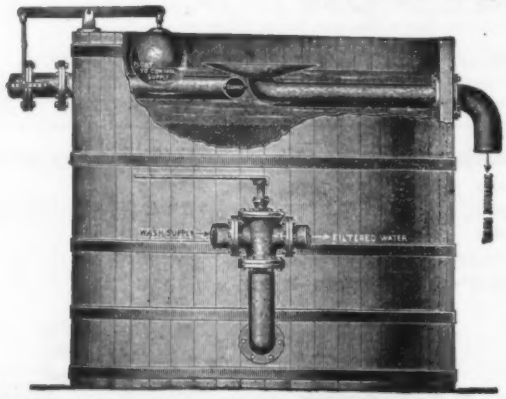
Manufacturers and Erectors of the

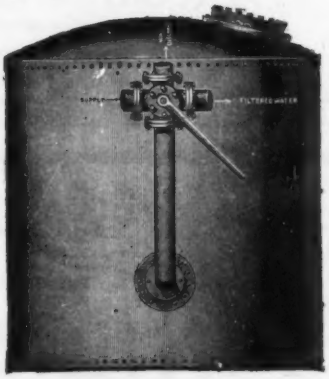
LOVELL WINDOW OPERATING DEVICE

AND SHEET METAL WORK OF EVERY DESCRIPTION

NORWOOD ENGINEERING COMPANY,

FLORENCE, MASS.





WILSON FILTERS FIRE HYDRANTS

Our filters are already in use in a number of the representative textile mills of the country, from whom we have received many expressions of satisfaction. Our representative will call and explain our system whenever desired.

G. WOOLFORD WOOD TANK MANUFACTURING CO.

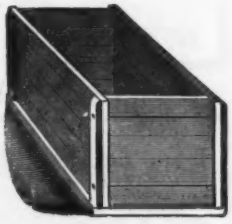
MANUFACTURERS OF

CEDAR AND CYPRESS
TANKS AND VATS

For Bleaching, Dyeing and Finishing.

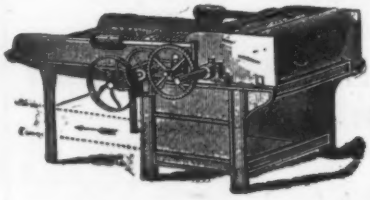
Reservoir Tanks of any Capacity or Shape for Sprinkler Systems and all purposes.

Office, Land Title Building, Broad and Chestnut, Phila., Pa.



Geo. W. Gerry & Son, ATHOL, MASS.

MANUFACTURERS OF



Lumpers,

Wool and Waste Dusters,
Rag Dusters, Nappers.

Improved Cloth Measuring Machines.

Lumper and Duster Cylinders Refilled and Repaired.

TRADE

MARK

"ALLIGATOR BRAND"

LOGWOOD EXTRACTS

HEMATINE, JAMAICA, B. W. I.

THE WEST INDIES CHEMICAL WORKS, LTD., 26 Cliff St., New York.

H. S. VILA,

115 So. Second St., Phila., Pa.
70 Kilby St., Boston, Mass.

Aniline Colors and Dye Extracts.

New Vilal Black Extra

An Improved Sulphur Black.

THE LATEST NOVELTIES IN FAST GREENS

(Equal to Sumac)

ARABOL MANUFACTURING COMPANY,

100 William Street, New York.

Sizing, Stiffening, Softening and Finishing Compounds, Glues, Gums, Dextrines, Starches, China Clay, Bone Size and Grease, Soap, Tallow, Weighteners,

EVERYTHING IN SIZINGS, Etc. SAMPLES MATCHED. HIGH GRADE GOODS.

Starch, Dextrine, Gum and Glue.

STEIN, HIRSH & CO.,

165 Duane Street, NEW YORK.

Chicago. Philadelphia. Boston.

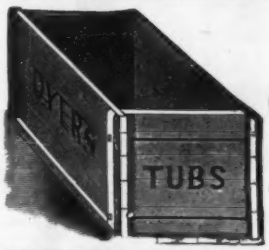
J. M. & J. S. NICOL,

North Paterson, N. J.

White Dextrine and Amylo Gum

FOR FINISHING.

SEND FOR WORKING SAMPLES.



Established 1868.

AMOS H. HALL, SON & CO.,

Manufacturers of

Cedar Vats and Tanks

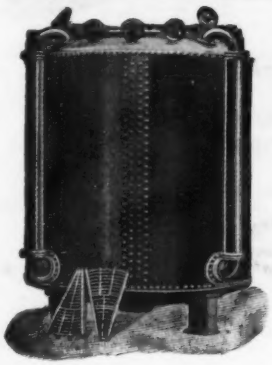
2915-2933 North Second Street,

PHILADELPHIA, PA.

Tubs and Tanks of all kinds for Dyers, Bleachers, Factories, etc.

Down Town Office, 140 Chestnut Street, Corner Second.

Hours from 12 to 1.



Kiers and Steam Boxes

BOILERS, TANKS, PLATE WORK

Special Attention
Given to Repairs

Wm. Allen Sons Company,

65 Green St., Worcester, Mass.

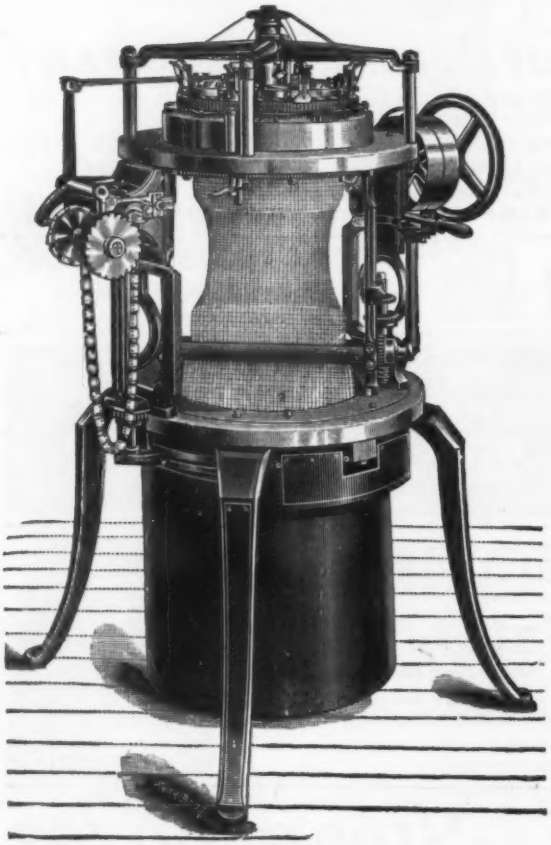
WILDMAN MANUFACTURING COMPANY

(Formerly McMichael & Wildman Mfg. Co.)

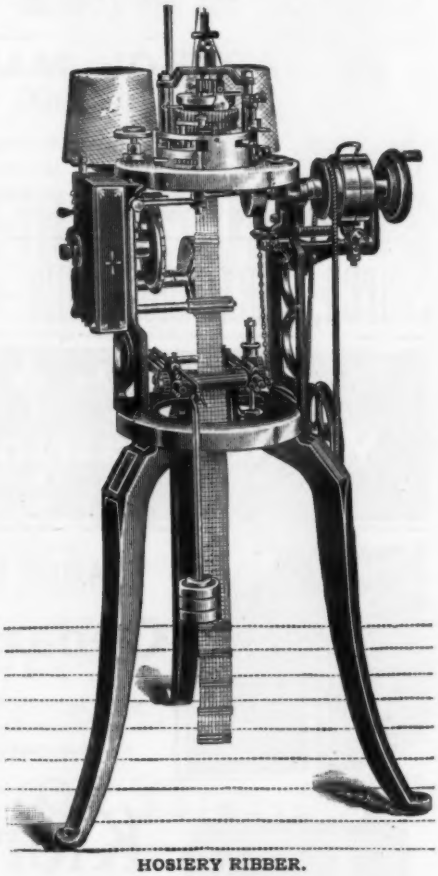
CIRCULAR RIB KNITTING MACHINERY

AUTOMATIC AND PLAIN

For all classes of Ribbed Hosiery and Underwear, Combination Suits, Sweaters, etc.



AUTOMATIC BODY MACHINE.



HOSIERY RIBBER.

ESTABLISHED REPUTATION FOR LARGEST PRODUCTION, BEST QUALITY FABRIC, DURABILITY, ECONOMY OF OPERATION

Full Particulars, Description and Samples Furnished upon Application to the

WILDMAN MFG. CO.

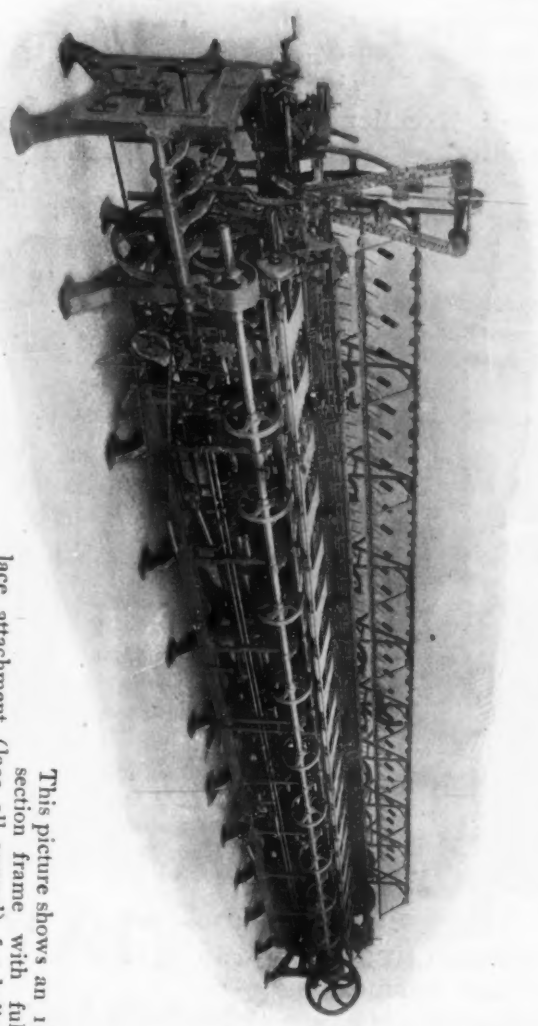
NORRISTOWN, PENN.

FULL
FASHIONED HOSIERY MACHINERY
COTTON SYSTEM.

BUILT BY

Schubert & Salzer Maschinenfabrik,

CHEMNITZ, GERMANY.



This picture shows an 18 section frame with full lace attachment (lace all around) for ladies hose. All classes of flat work machines for full fashioned hosiery in all gauges, from 14-32 needles to one inch, from 12 to 24 sections, also machines for full fashioned shirts and drawers in all gauges from 6 to 10 sections, with narrowing and widening. Split sole, plating, 2, 3 or 4 colors horizontal striping attachment, full lace and vertical striping machines.

OTTO WALTHER,

507 Bourse Building, Philadelphia, Pa.

NYE & TREDICK CO.

Circular Rib Knitting MACHINERY

For making Ribbed Underwear, Combination Suits, Sweaters, Cuffs, Shirt Borders, Hosiery, etc. : ; :

Correct Construction. Excellence and Durability.

LATEST IMPROVEMENTS
QUALITY OF FABRICS AND PRODUCTION
UNEXCELLED

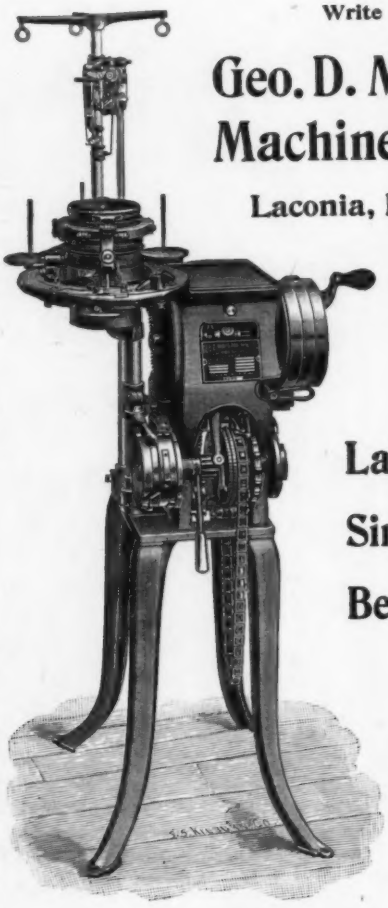
NYE & TREDICK CO.
606 Arch St., PHILADELPHIA, PA.

If You Want

Largest Production For Least Money

Write

Geo. D. Mayo Machine Co.,
Laconia, N. H.



Latest
Simplest
Best

MAYO'S

New Full Automatic Knitter.

PHILADELPHIA OFFICE,
KNICKERBOCKER BLDG., COR. SIXTH AND ARCH STS.,
B. M. DENNEY, REPRESENTATIVE.

Friedberger-Aaron
Mfg. Co.'s
Braids and Laces

The recognized

Standard Finish

for

Trimming Ladies'

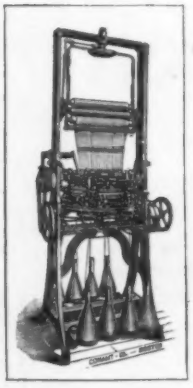
RIBBED UNDERWEAR

GERMANTOWN, PHILADELPHIA

P. O. Address, Logan Station.

CHARLES COOPER

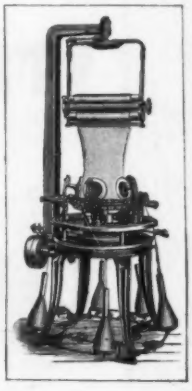
BENNINGTON, VERMONT.



MANUFACTURER OF

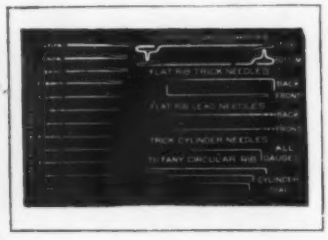
Knitting Machinery

Flat and Circular Rib, both Spring and Latch Needle, Plain Circular Machines, Lead or Trick Cylinder.

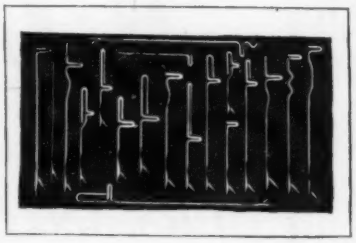


Spring Needle Cylinder Rib-Top Machines

For making Cuffs, Drawer Bottoms and Shirt Borders.



Spring and Latch Knitting Needles, Burr Wheels, Burr Blades, Sinkers, Jacks, etc.



COLLARETTE ATTACHMENT.

EUROPEAN REPRESENTATIVES.

MOSES MELLOR & SONS, Ltd.,
Nottingham, England.

REPRESENTATIVES.

C. J. SIBBALD,
757 River St., Troy, N. Y.

G. H. ROGERS,
509 Clinton St., Hudson, N. Y.

We Call Attention to the Following Trade Marks

Registered in the United States Patent Office
Under the new law taking effect
April 1st, 1905

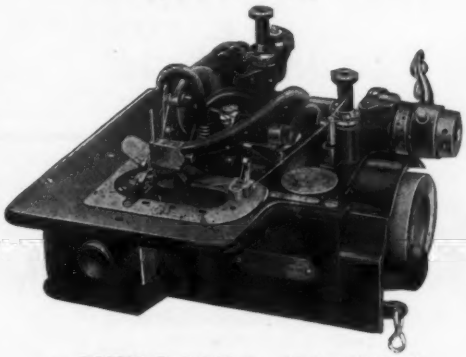
THE WORD

OVERLOCK

(*Granted July 18, 1905*)

As applied to Sewing Machines and Sewing Machine Attachments and Parts.

Continuously used since 1880.



THE WORD

OVERLOCK

(*Granted Aug. 20, 1905*)

As applied to Seams, Hems, Welts and Overedging.

Continuously used since 1880.

"OVERLOCK" MACHINE

(*Pat. April 5, 1892*)

Patent twice upheld by U. S. Court of Appeals.

THE MONOGRAM

(*Granted August 20, 1905*)

Picture of a Sewing Machine Head resembling the letter G combined with Needles arranged to form the letter W in monogram style.

Continuously used since 1871.

THE LETTERS AND CHARACTER

W & G

(*Granted August 1, 1905*)

As applied to Sewing Machine Parts and Attachments.

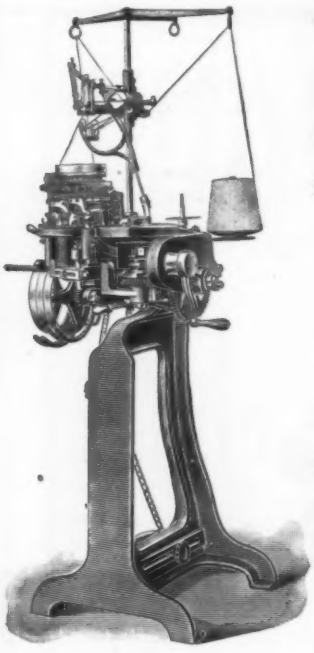
Continuously used since 1875.

WILLCOX & GIBBS SEWING MACHINE CO.,

GENERAL OFFICES: 658 BROADWAY, COR. BOND STREET,

NEW YORK.

BRANCH OFFICES IN ALL THE PRINCIPAL CITIES IN THE UNITED STATES AND EUROPE.



Also Furnished for Bench.

The Invincible

"The KNITTER that KNITS"

THE LARGEST PRODUCER OF PERFECT WORK.

SIMPLE, POSITIVE AND EASY TO OPERATE.

E. JENCKES MFG. CO.

Pawtucket, R. I.

R. M. OATES, Hendersonville, N. C., Southern Representative.

PHILADELPHIA OFFICE, 101 North Sixth St.

The Merrow

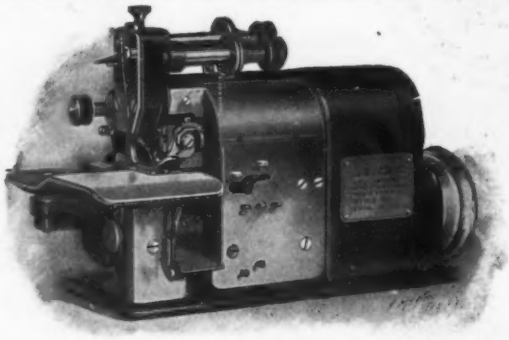
High Speed Overseaming, Overedging and Scallop Stitch Machines

are LIGHT RUNNING, FAST and DURABLE.

OUR NEW STYLE 60 MACHINE for Trimming and Overseaming in one Operation produces the strongest, best Seam and does it with the greatest economy.

STYLE 35 B SHELL MACHINE

For Necks and Fronts of Rib Goods, produces the most showy, substantial finish.



USE STYLE 17 or 22 for Bed Blankets and STYLE 18 for Horse Blankets.

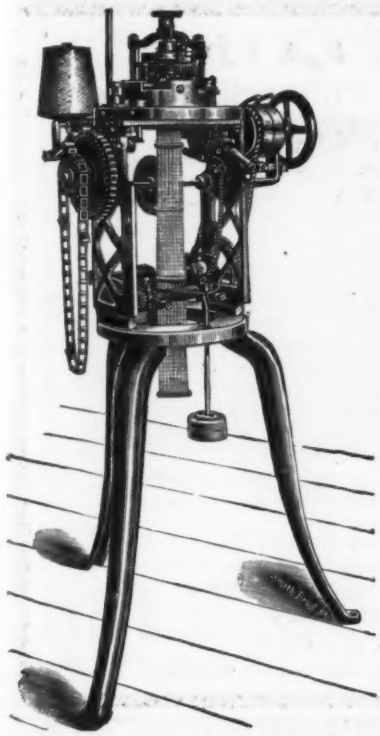
Send for Catalogue and Samples.

THE MERROW MACHINE CO.

Knickerbocker Building, Sixth & Arch Sts., Phila.

HARTFORD, CONN.

346 Broadway, New York



H. Brinton & Co.

213-215 Race Street, Philadelphia, Pa.

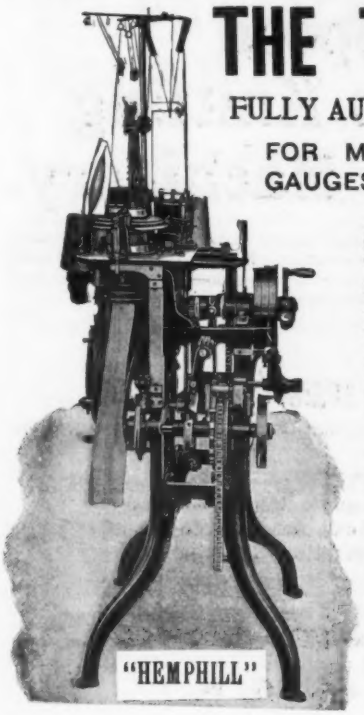
BUILDERS OF

Knitting Machinery

For HOSIERY and UNDERWEAR.

Complete Estimates Furnished. Send for Particulars.

The cut shows our **Improved Automatic Ribber** with Welt and Slack Course for Half Hose, Tops and Ribbed Legs.



THE TWO LEADERS

FULLY AUTOMATIC HOSIERY KNITTERS

FOR MAKING ALL KINDS AND GAUGES OF SEAMLESS HOSIERY

One with **GEARS**, the other with **CHAIN** for pattern mechanism, to meet the various tastes of different manufacturers.

Both used and approved by leading hosiery manufacturers.

Both contain all the well-known essentials demanded of first-class knitting machines.

With these two machines we can supply all manufacturers' possible wants in the best possible manner.

Write us for further particulars and prices.

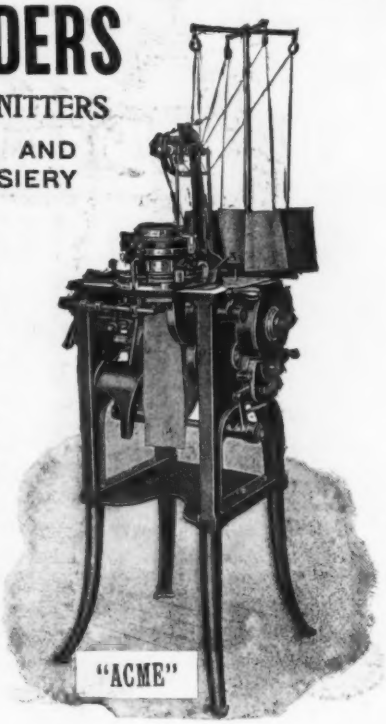
We also make all kinds of **LATCH NEEDLES.** Many leading manufacturers use our needles and say they are the best on the market. Send us a trial order.

MAYO

Knitting - Machine and Needle Co.,

FRANKLIN FALLS, N.H.

Philadelphia Office, Knickerbocker Bldg., Cor. 6th & Arch Sts.



JAMES TAYLOR,

835 Arch Street, - - - Philadelphia, Penn.

KNITTING MACHINERY

OF ALL KINDS. NEW AND SECOND HAND.

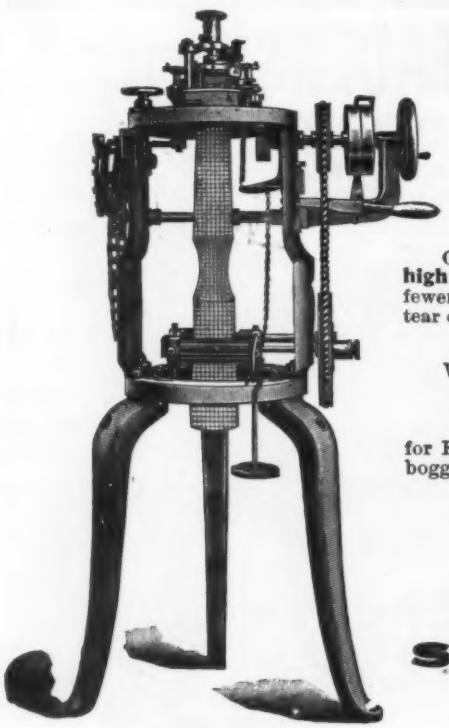
A RARE OPPORTUNITY TO BUY.

500 Payne bobbins.
10 Payne 48 spindle spoolers.
1 Bruce band folder and cutter.
50 Scott & Williams ⅞ aut. knitters, 176 needles.
5 Jenckes Invincible 176 n. machines.
2 Weston & Dennis Presses, 32x40 in., 15 Hollow Plates each.
Lot hosiery stamps, boards, etc.
38 Beattie & Hepworth & Abel loopers.
6 Hosiery presses (lever).
4 Lamb and Grosser sweater machines.
200 Ribbed underwear machines, various sizes.
50 Brinton & Co. ¾ aut. knitters, sizes.
24 Standard B machines, 200 and 160 n.
50 Union Special machines, various styles.
1 Rotary fire pump.
100 feet woven rubber hose, 3 inches dia
50 Mayo machines. Various sizes.
100 Brooks welters.
4 Fleecing machines. (Nappers.)
98 Brinton & Co. and other make hosiery ribbers.
1 40-Ribbed shirt machine cylinders and dials, all sizes, cuts and makes.
1 10 plate Crawford press, 32 x 48.
2 Lindsay & Hyde winders.
2 Grosser Jacquard machines for gloves.
3 Cyclone dryers
2 Typewriters.
5 Band folding and cutting machines.
4 30-inch ventilating fans.
1 Small Water Motor.
1 Small Steam Pump.
1 Small Belt Pump.
15 Rudolph Seaming Machines.

WRITE FOR COMPLETE LIST.

APPRAISEMENTS A SPECIALTY.

We are always in the market to buy good second-hand Knitting and Finishing Machinery.



High Speed Rib Knitting Machinery.

Our latest model machinery has been designed to run at very **high speed**, giving large production. This is accomplished with fewer seconds, less breakage of needles, less jar and wear and tear on machines than has been customary at lower speeds.

We also make Special

STRIPING AND DESIGNING MACHINES

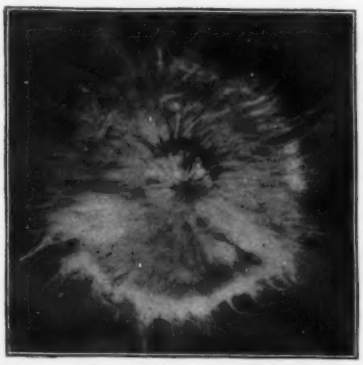
for Fancy Golf Stockings, Bathing Suits, Sweaters, Toques, Toboggan Caps, Skirts, etc.

Our Machinery gives large production at low cost and enables manufacturers to meet the market always and make a profit.

STAFFORD & HOLT,

LITTLE FALLS, N. Y.

Tam O'Shanter Decision.



Preliminary Injunction

Was granted us on August 22nd, 1905, by the Hon. J. B. McPherson, United States Circuit Court at Philadelphia against S. Cohen & Co. (Girard Knitting Mills) restraining them from manufacturing tams under our patent No. 669,011, dated Feb. 26th, 1901. The claims of our patent for making brushed, knit tams are broad and have been sustained by the Highest Court of Appeal.

All persons are warned against the manufacture of these goods by methods which infringe the claims of our patent under penalty of immediate legal proceedings.

Quaker City Knitting Co.,
Philadelphia.

NICETOWN MFG. CO.,
4303-09 No. 18th Street, Philadelphia.

MILL SOAPS

OF EVERY DESCRIPTION. ALSO LAUNDRY SOAPS.
ALL GOODS GUARANTEED.

HOSIERY AND MITTEN DRYING FORMS.
BEST MATERIAL. LOWEST PRICES.
Our guarantee goes with every board. Its Good.
Write us for OUR Prices
THE WISCONSIN MANUFACTURING COMPANY.
Two Rivers, Wis., U. S. A.

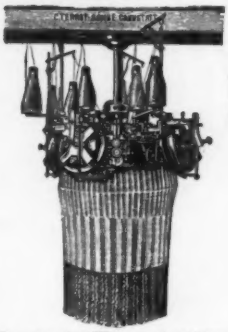
THE GROSSER KNITTING MACHINE CO.

WOOL EXCHANGE
Rooms 400-421

MAX NYDEGGER

260 W. Broadway
NEW YORK

SPECIAL MACHINES
FOR ANY ARTICLE THAT IS KNIT



GROSSER Flat Knitting Machines
For HAND power or **Fully Automatic Power Machines.** Most productive and best machines for Sweaters, Jackets, Blouses, Wool Hosiery, Gloves, Mittens, Sporting Goods in Plain, Fancy and Jacquard Work, Shaker Articles, etc. Large stock on hand.
Power machines to be seen in operation.

COTTON PATENT HOSIERY MACHINES
Built by **H. ALBAN LUDWIG, Chemnitz,** for automatic production of **Full Fashioned Hosiery, Fine Half Hose, Ladies' Lace Hose, Fine Underwear;** high Speed, large production. All gauges and any number of sections, from 2 to 24.

FRENCH FRAMES
C. TERROT SÖHNE, Cannstatt, Würt, famous builders of the best Circular Frame for **Finest Underwear, Fleece Linings, Gloves, Special à-jour** (open work) **Fabrics, etc.**

RASHEL MACHINES
For Fancy Goods in largest variety, **Shawls, Capes, Caps, Borders, Fringes, Lace Work, etc.,** in silk, wool, cotton.

SPOOLERS, Paraffiners, Finishing Machines, for the knitting business.

SPECIAL OVERSEAMERS, "Julius Kohler"
Indispensable for Full Fashioned Articles, Sweaters, Hosiery, Gloves, Sporting Goods. **Loopers,** self-cutting and cleaning.

Largest Stock in NEEDLES
For Knitting Machines. Best IMPORTED quality. All parts, accessories, etc., delivered immediately from stock.

Samples, Special Offers, Prices, etc., upon application.

EXCELSIOR KNITTING MACHINE MFG. CO.

BUILDERS OF

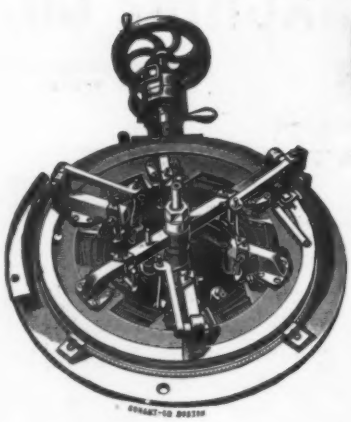
Full Automatic Knitters

WITH OR WITHOUT

Transferring Device

ALL SIZES AND GAUGES, 2 1-4 INCH TO 4 INCH

MEADOW AND WASHINGTON STREETS ALLENTOWN, PA.

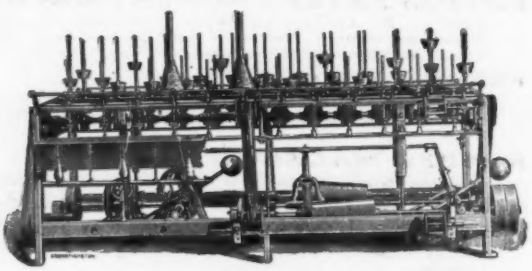


CIRCULAR KNITTING MACHINES

Either plain or full automatic, with stop motions complete. 4 to 24 feeds for

RIBBED UNDERWEAR

Automatic Racking and Striping Machines for Sweaters, Cardigans, Collarettes, Cuffs and Anklets.



ALSO BUILDERS OF THE WELL-KNOWN

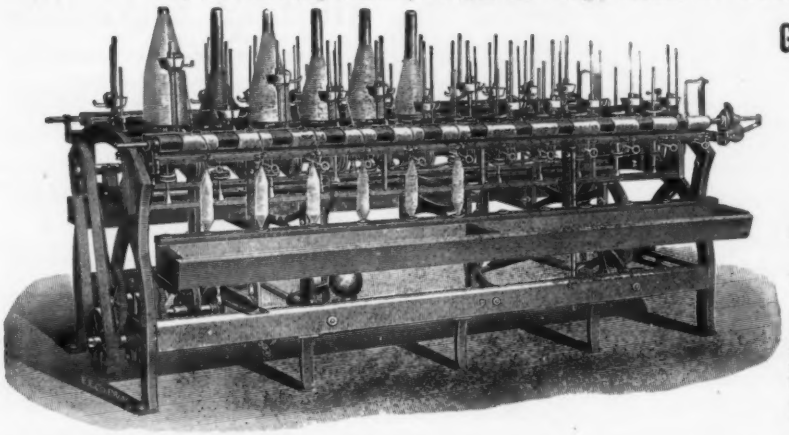
ABEL WINDERS, SEAMERS and LOOPERS.

LEIGHTON MACHINE CO., - Manchester, N. H.

GEO. W. PAYNE, Prest. J. MILTON PAYNE, Treas. CLINTON F. PAYNE, Sec'y.

OVER 1,650 PAYNE WINDERS IN USE

For Hosiery Mfrs., Wind for Cop, Skein or Bobbin.



GEO. W. PAYNE CO.,

[Est. 1865. Inc. 1902.]

Builders of the

Improved

Upright Spoolers,

To Spool from Cop, Skein or Bobbin.

Doubling Spoolers, for doubling 2, 3, or more ends into one,

Upright Quillers, Quill from Cop, Skein or Bobbin.

Ring Dresser, Spooler and Reel Spindles, Cop Skewers, Warp, Spool, Spooler, Guides, Bolsters and Stops Made and Repaired at Short Notice.

OFFICE, 102 BROAD STREET
Pawtucket, R. I.

WILLIAM C. BULL, BENNINGTON, VERMONT.

MAKER OF

For Ladies', Gents', and Children's Goods.

LATEST STYLES.

BEST WORKMANSHIP.

Drying Form Boards

OF EVERY VARIETY.

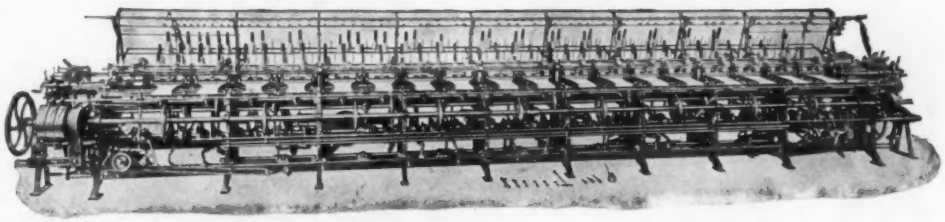
WORKS: CHEMNITZ, SAXONY. Established 1851.

G. HILSCHER

Full-Fashioned Hosiery and Underwear Machine Builder

Sole Agent for United States and Canada

EDWARD W. KOCH, 319 Bourse Building, Philadelphia, Pa.



"Awarded Gold Medal at World's Fair, Paris, 1900,

for highest improvement in the mechanism of manufacturing full-fashioned hosiery, solidity and perfect workmanship in construction and superiority of fabric produced."

SPECIALTIES:

COTTON-HILSCHER HIGH SPEED SYSTEM, 65 courses per minute.

COTTON SYSTEM, for horizontal stripes up to 6 colors, Scotch plaids and vertical stripes, lace through the narrowing, split, etc., etc.

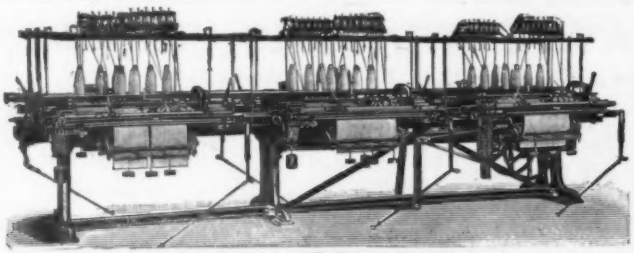
COTTON SYSTEM, wedge heel; this machine manufactures entire full-fashioned ladies hose or half hose and dispenses with the foot machine.

COTTON SYSTEM, newest construction. The new machine knits the entire hose or half hose complete down to the toe, it makes French heels and French feet.

RIB MACHINES: Cotton System, with and without narrowing.

RIB MACHINES: Hilscher System, high construction.

Machines can be seen in operation at above address.



Cardigan Jackets and Underwear Machine.

AUTOMATIC

Knitting Machines

For Plain and Fancy Goods.

THE BEST IN THE MARKET!

Special Constructions for different articles!

INDEPENDENT HEADS.

DOUBLE SYSTEM OF LOCKS.

Double-side Power Stands, 6 at once.

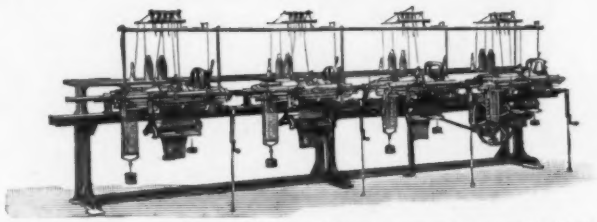
Paris, 1900, Gold Medal.

Ask for samples and particulars, state guage and size you want.

CLAES & FLENTJE,

Mülhausen, Thür, Germany.

Representatives: Ainslie Knitting Machine Co., Ainslie & Humboldt Sts., Brooklyn, N. Y., where all kinds of hand and power machines can be seen working.



Automatic Widening Machine for Sleeves, Drawers, Garments, Plain and Ribbed.

LEWIS JONES,

60½ and Media Streets, . . . PHILADELPHIA.

GAS ENGINES for city or country
BRUSHING MACHINERY
KNITTING MACHINERY

EFFICIENT
DURABLE
LOW IN PRICE

CRANE MFG. CO. Lakeport, N. H.

Spring Needle Circular

KNITTING MACHINE.

For Hosiery, Shirts, Drawers, Jersey Cloth and Stockinet.

A Specialty of Hardened Bladed Burr Wheels with Self-Oiling Brackets.

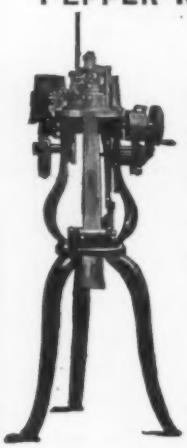
CRANE MFG. CO.

SUCCESSORS TO

PEPPER MACHINE WORKS

Lakeport, N. H.

Manufacturers of



Knitting Machinery,

INCLUDING

Pepper's Flat Ribbed Cuff Machines,

Automatic Welt and Loose Course Machines for Stock Tops. New Circular Stripers with Welt, Loose Course and Striping (Automatic), for Short Cuffs, Sock Tops, Hose Legs, Wristers, etc.

Golf and Bicycle Stocking Machines,

ALL KINDS OF

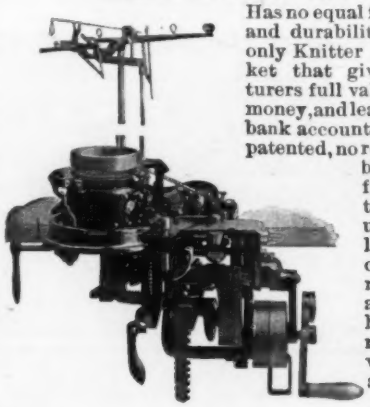
CIRCULAR RIBBED MACHINES

For Men's Underwear, Ladies' and Misses' Hose Legs and Leggins. Correspondence Solicited.

The New Improved

Boss 15/16 Automatic

KNITTER



Has no equal for simplicity and durability. It is the only Knitter on the market that gives manufacturers full value for their money, and leaves a swelled bank account. It is fully patented, no royalty to pay; built in sizes from 2½" up to 6"; from 42 up to 220 needles in 3¾" machine. Knits men's, ladies' and children's hose, plain or ribbed. Runs with one single belt. Automatic tension in heel and toe. Send for prices and particulars to

THE BOSS KNITTING MACHINE WORKS,

Cor. Elm and Reed Sts., Reading, Pa.

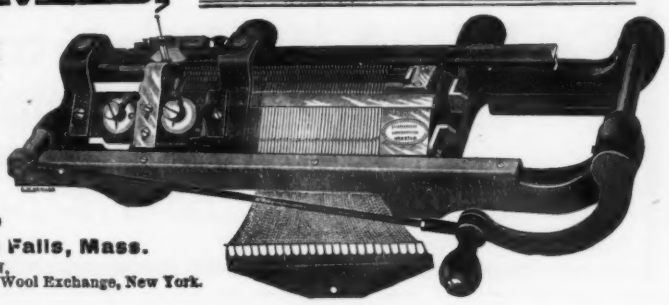
HARDENED STEEL CYLINDERS A SPECIALTY.

The LAMB, LEADER OF KNITTERS,

Original and Still the Best.

Most widely used; being operated in every civilized country in the world. For description, prices, etc., see catalogue.

CIRCULAR MACHINES,
RIB TOP and
SEAMING MACHINES.



LAMB KNITTING MACHINE COMPANY,

P. O. Box 5888, Chicopee Falls, Mass.

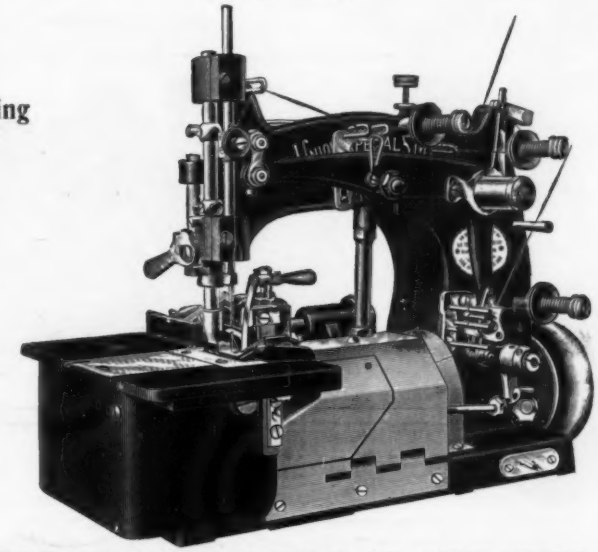
J. E. WOODHEAD, 109 22d St., Chicago.
L. D. SANBORN, Room 805 Wool Exchange, New York.

UNION SPECIAL

Class 15400 Simplicity **Single "Interlock" Machine** High Speed Durability

(TRADE MARK)

Overedge Seaming and Hemming.



Edge-Finishing and Ornamenting

Two or Three Thread Stitch.

Fabrics of Every Kind.

BY INCREASING PRODUCTION OF OPERATORS, THESE MACHINES REDUCE COST. EXPENDITURE FOR UNION SPECIALS ALWAYS MEANS A PROFITABLE INVESTMENT.

UNION SPECIAL MACHINE CO.

47 Leonard Street, New York
9 Andrews Street, Rochester, N.Y.
Amsterdam, N. Y.
Cohoes, N. Y.
75 E. Kinzie Street, Chicago
731 Arch Street, Philadelphia.
96 South Street, Boston
2 Gain Street, Montreal, Canada
578 Mission St., San Francisco
806 Main Street, Cincinnati
1230 Olive Street, St. Louis

PAXTON & O'NEILL'S

Full Automatic Knitter

FOR ALL KINDS AND GAUGES OF SEAMLESS HOSIERY.
RANGE ON HALF HOSE AND LADIES FROM 260 NEEDLES DOWN.

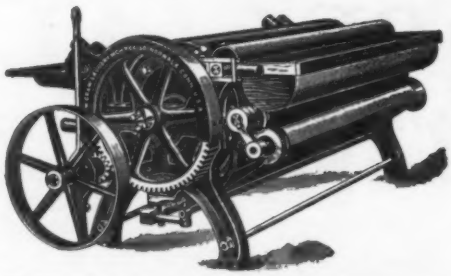
3-4 AUTOMATIC KNITTER

With Lace Effects.

Exclusive rights to BROWN'S LACE ATTACHMENT.

127 Bread Street, - - - - - - - PHILADELPHIA.

AUTOMATIC IRONING and PRESSING MACHINE for KNIT GOODS.



This machine irons and presses ribbed and flat underwear, giving a fine, smooth finish and most attractive appearance to the goods, not to be obtained in any other way. It does not break buttons. Inexpensive and easy to operate, and has large capacity. Knitting mills using them are greatly pleased with results. This method of finishing is sure to come into universal use. Send for further particulars to

J. W. CRAW LAUNDRY MACHINERY CO.,
SOUTH NORWALK, CONN.

HEPWORTH & CO.'S

Patent Single-Stitch

LOOPING MACHINE.

Needle working from the inside, avoiding the breaking of needles and points and picking up the metal.

Single and Double Stitch, or Both Combined.

JOHN W. HEPWORTH & CO.,
N. W. Cor. Lehigh Ave. and Mascher Street,
PHILADELPHIA.

Drying Forms.

BOARDS FOR FAST BLACK DYERS.

HOSIERY FINISHING BOARDS.

BEST WORK. PROMPT SERVICE. PRICES ALWAYS RIGHT.

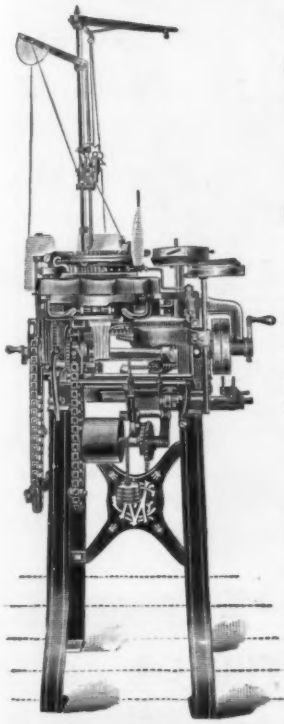
JOS T. PEARSON 1815-21 TAYLOR ST. KENSINGTON PHILA

Hosiery Boards.

We Know How

TO BUILD HOSIERY MACHINERY

That's Why There Are More Standards



in use than any other make.

Have you seen the new Standard F?

It will produce from **30%** to **50%** more goods than any other machine on the market.

Hosiery manufacturers are invited to inspect it in our show rooms.

ARE YOU INTERESTED?

STANDARD MACHINE CO.,
508 Ludlow Street,
Philadelphia.

KNIT FABRICS CUT TO LENGTH.

Our Knit Fabric Cutter

will cut from the roll, knit fabric into any length from 10″ to 40″ at the rate of 100 pieces a minute. The lengths are accurate, the waste is a minimum, the labor unskilled.

We also make a Slitter

for cutting these goods into narrow strips and rewinding same into rolls.

SAMUEL M. LANGSTON,

Manufacturer of Paper Box Machinery.

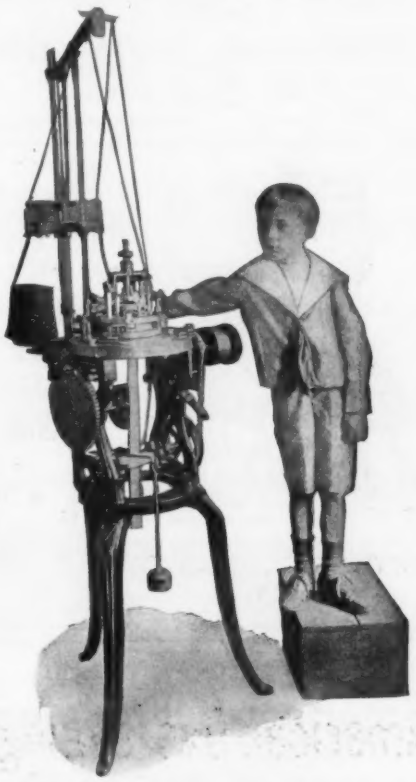
Ninth above Market Sts., Camden, N. J.

A FAIR PROPOSITION

If wanting to purchase Ribbers, you can try a

RUTH RIBBER and STOP MOTION

before buying to satisfy yourself that they are all right. Our STOP MOTION is a decided improvement over all others. No cutting of yarn, easy to thread. Stops from any imperfection in yarn. The movement of one lever releases brake and corrects yarn guide, when stop is caused by knot you have but one hook to thread. Very positive in its action.



Our RIBBER is high speed, durable, simple and easy to operate, with largest production; single or double feed, plain or fancy stitch for half hose and misses goods. Large loose-course, good round welt, double knee, sleeves or cuffs. Knits wool or cotton yarn, fine or course guage. Hardened cylinders and dials for any make of machine. Best Workmanship. All products guaranteed. Can attach STOP MOTION to any style machine.

Write to-day for price lists.

RUTH MACHINE CO., York, Pa.

Address Box "N." G. W. Ruth, Manager.

Do you wish to make knit goods as perfect as the French or German, and as rapidly as the American?

Do you want to plait?

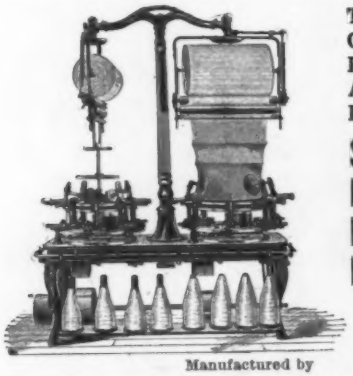
Do you want to knit worsted or silk?

?

WRITE TO

TOMPKINS BROS. CO.,

TROY, N. Y., U. S. A.



THE GREATEST PRODUCING AND MOST PERFECT

SPRING NEEDLE KNITTING MACHINE

IN THE WORLD

Manufactured by

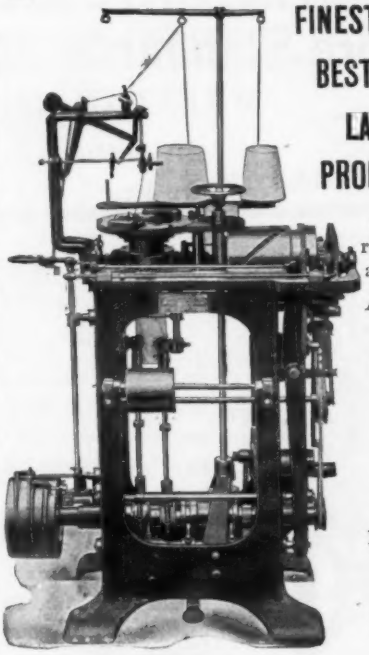
ROBERT W. CORMLY & CO.,

TROY, N. Y.

Thirty-five years' practical experience.

"NATIONAL"

Stands for



FINEST GAUGES

BEST FABRIC

LARGEST PRODUCT ON

Greatest Variety of Laces, and Novelties.

All automatic.

Lowest Cost for Operating

Also Rib Knitting Machinery, Overedge, Crochet and Shell Stitch.

NATIONAL AUTOMATIC KNITTER CO.

728 Cherry Street, PHILADELPHIA, PA.

Julius Kayser, Pres. Simon Banner, Treas.

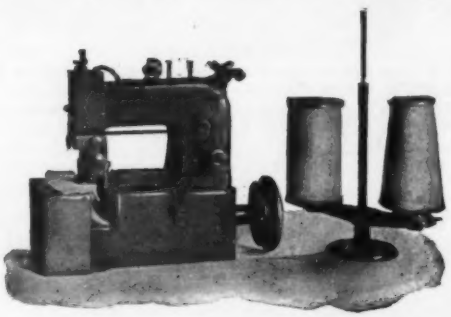
American Overedging and Seaming Machine Co.

Manufacturers of

Overedging

AND

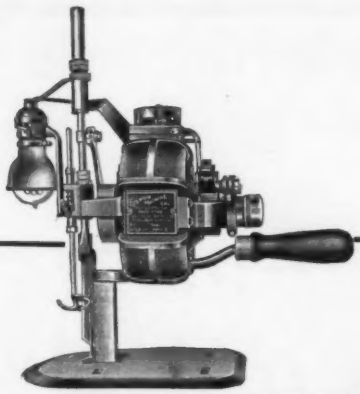
Seaming Machines



For All Kinds of

Cut and Full Fashioned Underwear and Sweaters

FACTORY, 543 EAST 116th STREET - - - - - - - NEW YORK CITY



MACHINE CUTTING

of Clothing, Shirts, Hats, Shoes, and all other articles of men's and women's wear is no longer an experiment—it's the way of to-day—having won its position into the best shops in America strictly on its merit. It's quicker, more economical, and more accurate than any other method of cutting.

THE EASTMAN MACHINE COMPANY,

41 and 43 East Eagle St., BUFFALO, N. Y.

OFFICES:—New York, 107 Walker St. Chicago, 245 Jackson Boulevard. Baltimore, 305 W. Fayette St.

BAND PAPERS

FOR

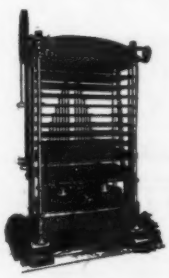
HOSIERY, SHIRTS AND ALL PURPOSES WHERE A WHITE, TINTED OR BLACK BAND IS USED.

If you want fine quality at the same cost specify our paper to your printer.

CHAS. BECK PAPER CO., LTD.

PHILADELPHIA, PA.

The CRAWFORD



HOLLOW STEAM

PLATE PRESS

For Knit or Woolen Goods.

The most reliable machine of the kind on the market.

PRESS PAPERS and FENDERS.

SPENCE & RIDEOUT,

Successors to
J. J. CRAWFORD & SON,

NASHUA, N. H.

Established 1868.

Best Knitting Machines

IMPROVED CONSTRUCTION

FOR HAND AND POWER DRIVING.

High Speed, Excellent Workmanship.

Auto. Rib-top, Fancy-stitch Jacquard Machines.

Everywhere in work. **80,000** Machines sold.

CLAES & FLENTJE,

Mühlhausen, Thür, Germany.

Agents for the East: Ainslie Knitting Machine Co., Ainslie and Humboldt Sts., Brooklyn, N. Y.
Agents for the West: Logan Knitting Factory, Logan, Utah.

DAVENPORT PEARL BUTTON CO.

Davenport, Iowa.

Manufacturers of

PEARL BUTTONS.

New York Office, - - - - - 377 Broadway

BUTTONS

ALL KINDS OF BUTTONS

Fine Specialties for Fancy Knitting Trade.

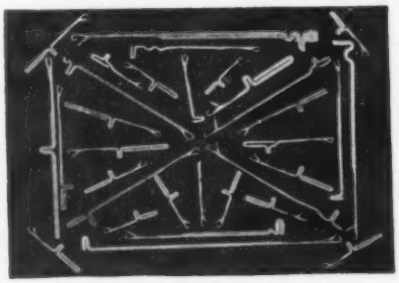
WRITE US FOR UP TO DATE SAMPLES.

INTERNATIONAL BUTTON CO., Rochester, N. Y.

NEW YORK OFFICE, 826-828 BROADWAY.

TRY OUR "SUPERIOR" OR SUNKEN RIVET-HEAD NEEDLES

They will save you money.



Dodge Needle Co., Manchester, N. H.

WM. COREY CO.,

Manufacturers of Knitting Machine

Latch Needles,

MANCHESTER, N. H.

EXCELSIOR NEEDLES.

The best Hosiery Needles in the market.

Manufactured by

WARDWELL NEEDLE CO., Lakeport, N. H.

W.M. BREEDON'S SON,

MANUFACTURERS OF

Spring Knitting Needles

AND BURR BLADES OF ALL KINDS.

AMSTERDAM, - N. Y.

ORION TREAT,

MANUFACTURER OF

Screw Riveted Balmoral and Double Rib NEEDLES

(Patented May 6, 1890.)

All Work Guaranteed. MANCHESTER GREEN, CONN.

Standard Latch Needles

MANUFACTURED BY

EXCELSIOR NEEDLE CO.,

TORRINGTON, CONN.

The Largest Manufacturers of Machine Needles in the World.

STANDARD

TRADE MARK.

Longer Wear. Better Work.
Less Mending. Fewer Seconds.

Have you tried our

Patent Milled Rivet.

Agents

C. B. Barker & Co., Ltd., 42 W. 15th St., New York.
Manufacturers' Supplies Co., 418 Arch St., Phila.
C. Shawl, 32d St., San Francisco, Cal.
J. C. Strittmatter, 2a Calle de San Francisco No. 9, City of Mexico, Mexico.

L. T. IVES CO.

Manufacturers of all kinds of

SPRING KNITTING NEEDLES

NEW BRUNSWICK, N. J.

PAGE NEEDLE CO.,

MANUFACTURERS OF

LATCH NEEDLES

of all kinds. Warranted in every respect.

CHICOPEE FALLS, MASS.

Agents: J. E. Woodhead, 100 Twenty-second Street, Chicago, Ill. Durbrow & Hearne Mfg. Co., 12 Wooster Street, New York. James Taylor, 835 Arch Street, Philadelphia, Pa.

Manufacturers' Supplies Co.

418 ARCH STREET, PHILA.

Needles and Supplies for Knitting Mills.

Agents for EXCELSIOR NEEDLE CO., and NATIONAL NEEDLE CO.

The Continental Latch Needle Company.

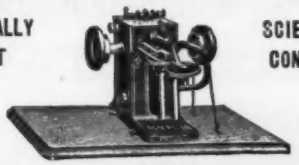
Manufacturers of the BEST GERMAN NEEDLE on the Market.

RIVETS GUARANTEED. Will send samples on application. CORRESPONDENCE SOLICITED.

120-122 LIBERTY STREET, - - - - - - - - - NEW YORK.

AMERICAN OVERSTITCH

MECHANICALLY PERFECT



SCIENTIFICALLY CONSTRUCTED

Unequalled for finishing **Sweaters** in **One Operation.** Sewing in **Sleeves** with **Loops** on. For **Knit Gloves,** etc.

SAVES TIME — TROUBLE — LABOR

Write now CHARLES H. BRIDOUX

18-30 W. Randolph St., Chicago, Ill.

G. Bickelhaupt Skylight Works

Sole Manufacturers of
G. B. TRADE MARK SPECIALTIES.

SELF-LOCKING SCUTTLE OPENER.

Skylight Lift and Skylights.

Established 1869. Send for pamphlets.

243-245 N. 47th Street, - NEW YORK.

SAVOGRAN

Cleans Wool, Floors, Anything.

INDIA ALKALI WORKS, Boston.

WE BUILD MECHANICAL DRAFT FANS
A FAN SYSTEM OF HEATING AND VENTILATION IS FAR
SUPERIOR TO ANY OTHER
WE DESIGN AND INSTALL SUCH PLANTS COMPLETE IN EVERY DETAIL
MASSACHUSETTS FAN CO.
WALTHAM MASS.

FIRST CLASS MILLS USE

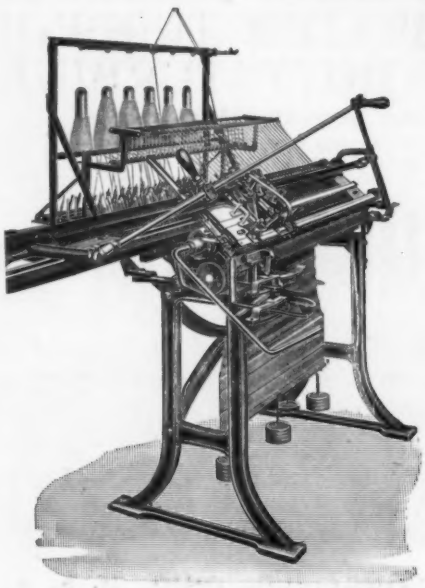
LOWELL CRAYONS

WHY?

They are Worth their Cost.

Will you try our Samples?

LOWELL CRAYON CO., LOWELL, MASS., Original Manufactur'rs



Walter & Co., Limited.

Mühlhausen i/Thür, Germany.

SPECIAL MANUFACTURERS

— OF —

KNITTING AND WINDING MACHINES

for hand and power driving, of best quality and perfect construction.

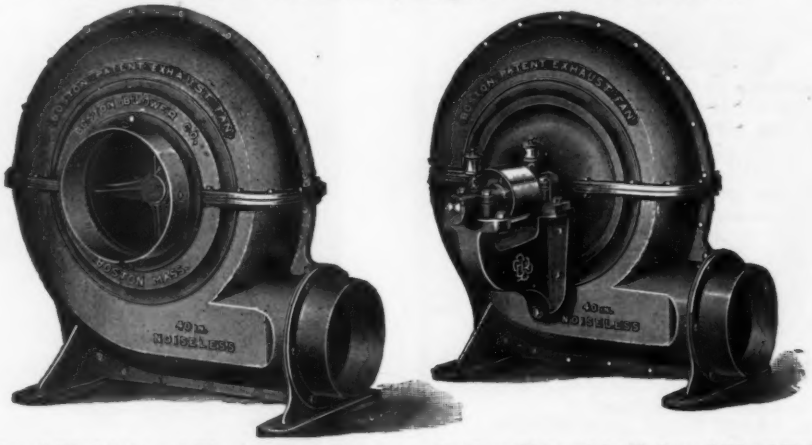
SPECIALTY: JACQUARD MACHINES

for hand and power driving for manufacturing of sweaters and every possible fancy article of that nature.

PRICE LISTS AND SAMPLE ON APPLICATION.

Boston Wool Exhausters, with Removable Tops.

As used in Connection with Pneumatic Conveyor System for Handling Wool, Cotton, Rags, Excelsior, Jute, etc.

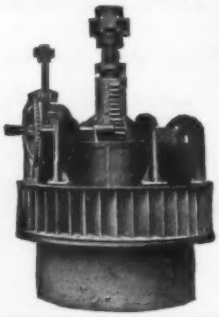


Inlet Side of Right-hand Wool Exhauster. · **Pulley Side of Left-hand Wool Exhauster.**

This machine is similar in design to the regular Boston Patent Exhaust Fan, but is fitted with a special wheel for handling fibrous materials, and the top is removable.

This latter feature is especially desirable when handling wet or greasy materials or in handling anything, in fact, which would leave a deposit on the inside of fan, as the entire top may readily be removed for inspection or cleaning without disconnecting either pipe or belt connections.

BOSTON BLOWER CO., Main Office and Works: **Business and Glenwood Sts., HYDE PARK, MASS.**



Risdon=Alcott Turbine Co.

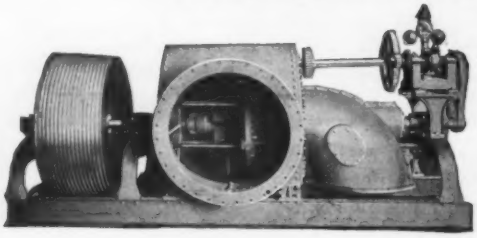
MOUNT HOLLY, NEW JERSEY, U. S. A.

RISDON CELEBRATED TURBINE
ALCOTT HIGH DUTY TURBINE

On Horizontal or Vertical Shafts.

These Turbines are recognized as the most effective water wheels made. Your inquiries should come direct to us for this class of machinery.

SAMSON TURBINE

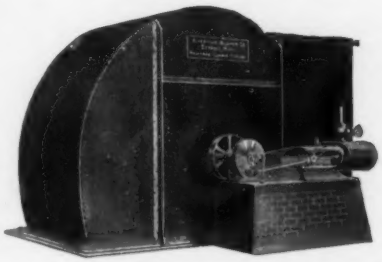


The higher the SPEED of a GENERATOR the LOWER its COST. We can SAVE YOU MONEY if you will use the SAMSON to drive the generator because there is not another turbine built that will attain as quick a SPEED when operating under the same conditions.

Write Department A-5 for Catalogue.

The James Leffel & Co., SPRINGFIELD, OHIO, U. S. A.

A Factor of Economy in the Power Plant



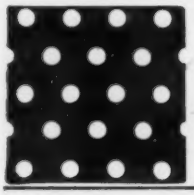
More Uniform Draft at Reduced Operating Expense is the Record of the "A B C" System of Mechanical Draft . . . . . .

AMERICAN BLOWER CO. - Detroit, Mich.

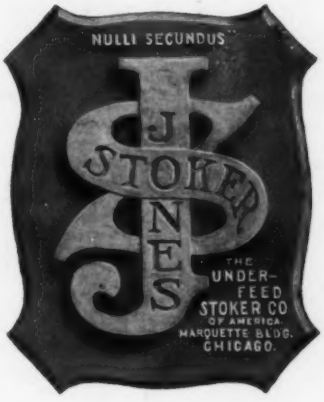
NEW YORK CHICAGO ATLANTA LONDON

CHARLES H. SCHNITZLER,
Patentee and Sole Manufacturer of
THE PNEUMATIC CONVEYOR
For the handling of wool and cotton stock, rags, excelsior, jute and all kinds of fibrous material, wet or dry. Also spool elevators, steam heating and ventilating, and mill work generally. Blower and fan work a specialty. This conveyor is patented. Beware of infringement.
SATISFACTION GUARANTEED. Patented Oct. 15, 1869.
215 NORTH SECOND ST., - PHILADELPHIA, PA.

Water Wheel Governors
For TEXTILE MILLS
We Guarantee Satisfaction.
Replogle Governor Works
Write for Catalogue T. AKRON, OHIO.



A. J. BECKLEY
PERFORATED COPPER
For Wool Scouring, Renser Boxes, Dyeing of Raw Cotton, Duster Screens, Picker Screens.
Perforated Screens of all kinds.
Factory and Office:
GARWOOD, NEW JERSEY.



PAIR McCORMICK TURBINES

4,000 H.P., 72 ft. head, arranged to drive generator and a single turbine to drive exciter. Five settings built for the Hudson River Water Power Company's Spier Falls plant and 14 pairs 51 inch for their plant at Mechanicsville, N. Y.

Write for Catalogue if contemplating purchase of turbines.

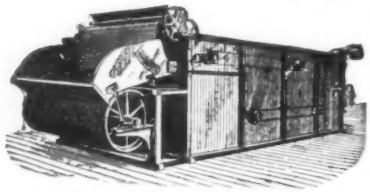
S. MORGAN SMITH CO.
YORK, PA.
Boston Office, 176 Federal Street.

OCT 14 1905

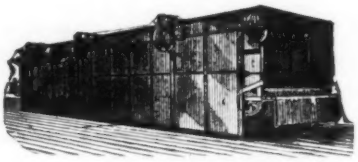
ONE COPY RECEIVED

"CYCLONE" DRYERS

For Cotton Stock, Wool Stock, Rags, Yarn, Cloth, Underwear, Stockings, etc.



Automatic Cotton or Wool Stock Dryer.



Automatic Yarn Dryer.

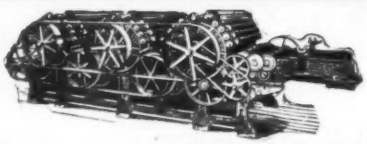
Steel Bladed Ventilating Fans.

Complete Carbonizing Outfits for Wool, Rags or Cloth.

IRON BOWL YARN SCOURING MACHINES.

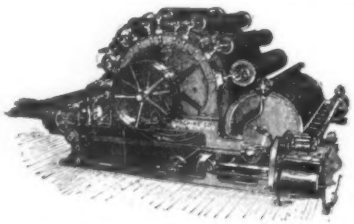
THE PHILADELPHIA TEXTILE MACHINERY CO.,

Hancock and Somerset Streets, PHILADELPHIA, PA., U. S. A.

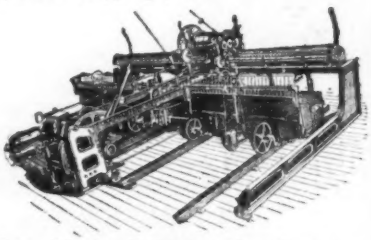


CARNETT MACHINES AND PICKERS

For reducing to Fibre Cotton and Wool Waste, Cloth Clippings, Etc.



WOOLEN MILL MACHINERY



Including Rag, Wool and Burr Pickers, Wool, Worsted and Shoddy Cards, Mules, Yarn Twisters, Warpers, Dressers, Spoolers, Etc.

Complete Equipment for Manufacturing Cotton Batting for All Purposes.

Special Carding and Spinning Machinery for manufacturing Yarn from such low grade stock as Mill Sweepings, Linters, Etc.

We reclothe or furnish new Metallic Toothed Cylinders and Rolls and relagg or furnish new Cylinders for any make of Rag Picker.

SMITH & FURBUSH MACHINE CO., Hancock and Somerset Streets, **PHILADELPHIA, PA., U. S. A.**

Are You on the Mailing List of The Butterick Herald?

The Butterick Trio publishes a monthly advertising journal almost as large as the largest of the periodicals devoted to the subject of advertising.

It is called THE BUTTERICK HERALD, and, being devoted to the subject of advertising the goods that are bought by women, it has the directness and the value that result from specialization.

No business man in that field ought to be without THE BUTTERICK HERALD.

To the Textile Manufacturer, whether he is an advertiser or not, THE BUTTERICK HERALD is invaluable, for the sane, practical way in which it covers every department of the subject, from the Manufacturer's advertising plans to the ultimate distribution of his product through the Retailer.

Every Manufacturer, Jobber, Wholesaler and Retailer should read it regularly.

There is no charge. We shall be glad to put ***You*** on the mailing list. Write to-day.

RALPH TILTON, Manager of Advertising, The Butterick Trio

THE DELINEATOR
THE DESIGNER
NEW IDEA WOMAN'S MAGAZINE

Butterick Building, New York

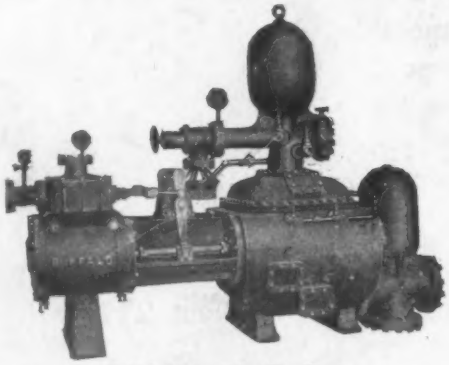
THE NEW FOSTER WINDER

OPEN WIND from start to finish of cone.
No press-offs from knots, no flattening of yarn.
The only perfect system of winding yarn.
for knitting purposes.

TUBE WINDERS, SKEIN WINDERS, DOUBLERS.

FOSTER MACHINE COMPANY,
WESTFIELD, MASS.

Fire Protection



Buffalo Underwriter Fire Pump

When danger threatens an added security is felt by the mill or factory owner whose fire fighting system includes a Buffalo underwriter pump

Built throughout from new patterns, in strict conformity to the 1904 specifications

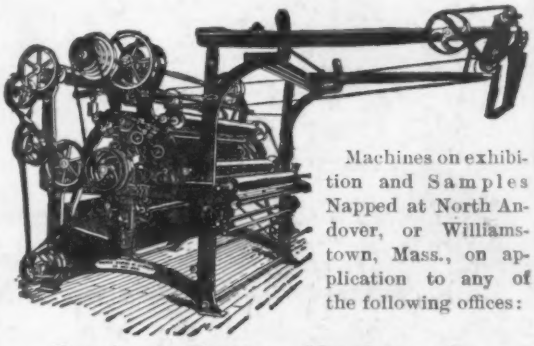
Send for Catalogue, just out

Buffalo Steam Pump Company

BUFFALO, N. Y.

THE AMERICAN NAPPING MACHINE CO.

Own the principal patents on Napping Machines, representing the latest French, English and American Patents.



Machines on exhibition and Samples Napped at North Andover, or Williamstown, Mass., on application to any of the following offices:

Davis & Furber Machine Co.,
Builders and Selling Agents, ... North Andover, Mass.
Geo. S. Harwood & Son, 53 State St., Boston.
H. P. HEAP, Treasurer and General Manager
WILLIAMSTOWN, MASS.

Walworth Manufacturing Co.,

HIGH PRESSURE

VALVES AND FITTINGS

"Walmanco" Pipe Flanges,
"Never Stick" Blow-off Cocks, Mill Supplies.

GENERAL OFFICES:
182 FEDERAL STREET, BOSTON, MASS.
New York Office: Park Row Building.